NOT JUST SMALL POTATOES: A COMPARISON OF FOUR AGRICULTURAL EDUCATION MODELS IN ALASKA

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Abstract

Agricultural education is a means of increasing food security, increasing willingness to try new fruits and vegetables, improving test scores, and increasing community resiliency. School gardens, which are one form of agricultural education, are the primary focus of this thesis. In order to identify barriers to maintaining school garden programs, semi-structured interviews were conducted at four school sites in the Fairbanks area. In order to compare emerging themes from the interview data in the Fairbanks area to school sites throughout the state, a survey was also administered through Survey Monkey to schools that received the Alaska state Farm to School grant between the years 2011-2014. Using Diffusion of Innovation Theory as a theoretical lens to perform qualitative data analyses, several emerging themes are highlighted including: An increase in student's nutritional awareness, children's love of dirt, participant empowerment, the need for more time, a decrease in productivity where uncertainty is present, and the need to further develop communication channels between agricultural education practitioners. Recommendations are made based upon findings to further support the creation and maintenance of agricultural education projects throughout the state.

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Acknowledgments

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Chapter 1: Introduction

1.1 Project Overview

School gardens and agricultural education programs are growing in application and popularity throughout the United States, including Alaska. They are seen as a tool for increasing children's preference for fruits and vegetables, providing children with alternate learning spaces, improving test scores, and increasing students' sense of well-being (Berezowitz, Bontrager Yoder, & Schoeller, 2015; Chawla, Keena, Pevec, & Stanly, 2014; Ratcliffe, Merrigan, Rogers, & Goldberg, 2011). The goal of this project is to gain a more in depth understanding of how different organizations support agricultural education in Fairbanks. Four organizational approaches were examined: FFA (formerly known as Future Farmers of America, currently known simply as FFA), Alaska Farm to School, Taproot Community Farm and Learning Center, and a school embedded within a religious community. A school garden from each of these paradigms was identified and then relevant participants were selected for in-depth semi-structured interviews. In addition, a survey was administered to schools that received the Farm to School grant from 2011-2014 for agricultural education projects including but not limited to school gardens. The purpose of the survey is to understand the barriers and successes each agricultural education project has faced since receiving Farm to School funding. Themes from the survey and interviews are examined through the lens of Diffusion of Innovation Theory in order to understand what elements aid and hinder the diffusion of agricultural education and in specific, school gardens, throughout Alaska.

1.2 Rationale

An assessment of the efficacy of the mini-grant program in sustaining Farm to School activities still provides key information, even though the original program no longer receives state funding. This information can help guide policy decisions for any future iteration of this program including the upcoming mini-grants sponsored by the Alaska Farm Borough, as well as other USDA grants focusing on developing agricultural education.

The USDA Farm to School Program awards up to 5 million dollars annually to farm to school projects categorized into four different types: Support Service, implementation, planning, and training. The 2010 Healthy, Hunger-Free Kids Act allocated funding for these grants. The Farm to School Act of 2015 proposes an expansion of services offered as well as a 15-million-dollar annual grant budget, which is three times the current annual budget. The bill has been introduced to but has not passed the Senate committee yet (Farm to School Act of 2015, n.d.) Farm to School programs are gaining popularity nationwide and one can expect activity to continue in Alaska through a creative and diverse sources of funding.

1.3 Overview of Agricultural Education Programs

The presence of agricultural education in school systems can be traced back to the Smith-Hughes Vocational Educational Act of 1917. This act delegated federal funds to develop vocational education. At the time, it was meant to prepare the working class for work in the home, field, and factory. The purpose of vocational training has evolved over time. In 1984, Congress passed the Carl D. Perkins Vocational Education and Applied Technology Act. The original act focused in part on reaching underserved populations by directing 57% of federal grants to states for this purpose. However, the revised Perkins Act of 1998 removes wording

requiring specific percentages of funding to be directed towards underserved populations and shifts the focus from curriculum mainly focused on hands-on job skills to a combination of academic/theoretic skills as well as hands-on job skills. The current goal is to prepare students for an ever-changing and technologically sophisticated job market (High School Vocational Education: Past and Present, n.d.).

While not all programs that focus on career and technical education are funded through the Perkins Act, the evolution of the Smith-Hughes Vocational Education Act of 1917 set a precedent for prioritizing career and technical education. The result is that there are many agricultural education and local food procurement projects statewide. A complete list is not possible as they are numerous and ever evolving. In order to narrow the scope of this research, I chose to focus on four organizations that were or are active in the Fairbanks area: FFA, Taproot Community Farm and Learning Center, Alaska State Farm to School Program, and a school embedded within a religious community. Other active organizations are the Alaska Farm Borough, Ag in the Classroom through the Fairbanks Soil and Water Conservation District, Alaska Food Policy Council, 4-H, and many more.

1.3.1 FFA. FFA is a nationwide organization committed to making "A positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education" (Our Mission, n.d.). FFA is implemented by focusing on an integrated learning model consisting of three parts: Classroom instruction, participation in a leadership organization such as FFA, and a supervised agricultural experience (SAE). The National FFA organization homepage states that the supervised agricultural experience allows students to, "apply what they are learning in the classroom as they

prepare to transition into the world of college and career opportunities" (Supervised Agricultural Experiences, n.d.)

FFA is active throughout Alaska with chapters in North Pole, Anchorage, Kodiak, Delta Junction, Palmer, Kenai, Wasilla, and Kake. There are three schools in the Fairbanks North Star Borough School District that have FFA Chapters: North Pole High School, Hutchison Institute of Technology, and Effie Kokrine Early College Charter.

1.3.2 Taproot Community Farm and Learning Center (Taproot). Taproot, a non-profit organization, was established in 1999 and became involved with Farm to School activities through their Schoolyard Garden Initiative in 2001. The Schoolyard Garden Initiative supports schools by, "caring for school gardens during the summer, consulting on garden design and development, and supporting teachers in using the gardens and maintaining a network of communication between schools" (Schoolyard Garden Initiative, n.d.). The Schoolyard Garden Initiative meets school's needs by planting and maintaining the garden during the summer and assisting teachers in utilizing the school garden.

The garden sites may also be used as Learning Ecology and Alaskan Farming (LEAF) summer camp sites. LEAF offers week long programming for children ages 5-18. Both the LEAF and Schoolyard Garden Initiative programs are fee based. There are currently six schools and five gardens involved with the Schoolyard Garden Initiative: Chinook Montessori Charter School, Hunter Elementary School, Pearl Creek Elementary School, Randy Smith Middle School who shares the garden with Anne Wien Elementary School, and Woodriver Elementary School (Schoolyard Garden Initiative, n.d.).

1.3.3 Alaska Farm to School Program. The bill that created the Alaska Farm to School pilot program is House Bill (HB) 70. HB 70 had two main goals: The first is to promote innovation and growth in the agricultural industry and the second is to create the Farm to School Program. The farm to school program, administered through the Division of Natural Resources (Laws of Alaska, 2010), was endowed with an 180,000-dollar annual budget (DeMarban, 2015).

The Alaska Farm to School Program has achieved recognition from multiple parties. The 2012 Farm to School Evaluation states that, "AFTSP [Alaska Farm to School Program] is absolutely meeting the expectations of stakeholders. Based on the key informant interviews, stakeholders are very pleased with the direction the program is taking, its goals, and its implementation methods" (Alaska's Farm to School Program, 2012). The program also received praise from Stacey Sobell, Western Regional Lead for the National Farm to School Network. Sobell was quoted in an article published by UAF News and Information saying:

> While Alaska joined the world of Farm to school in earnest in just the last couple of years; it has done so with tremendous gusto. Under the enthusiastic leadership of Johanna Herron, Alaska is now recognized as a national leader in Farm to School, producing models that have been shared with and emulated by other states across the country (as cited in Tarnai, para.14, 2013).

1.3.4 Religious affiliation. Quail Run is part of a Pre-kindergarten-12th grade school with a religious affiliation. The school garden received a onetime $5,000 grant from Sisters of Charity of Saint Elizabeth, a Catholic organization based out of New Jersey. Mariana runs the school garden and states that the garden aligns with the school's Jesuit tradition of growing food. The

school garden partners with a local soup kitchen and donates much of the produce they grow. In turn, the nearby religious community provides volunteer support.

1.4 Multiple Benefits of Agricultural Education

Ever since Delaine Eastin, former California Superintendent for Public Instruction, called for a garden in every school, California has embarked upon a campaign to build, maintain, and sustain school gardens throughout the state (Ozer, 2007). California is not alone in recognizing the multi-faceted benefits of school gardens. First Lady Michelle Obama created the Let's Move! Initiative which advocates for eliminating obesity and advocates for school gardens (Gardening Guide, n.d.)

However, addressing type II diabetes is only one of the many benefits of school gardens and increased local food procurement. School gardens have been suggested to improve academic performance (Berezowitz et al., 2015 & Chawla et al., 2014) increase fruit and vegetable intake (Berezowitz et al., 2015; Chawla et al., 2014; Ozer, 2007; Ratcliffe et al., 2011; Somerset & Markwell, 2009; Viola, 2006), and increase community resiliency (Chawla et al., 2014; Ozer, 2007).

1.4.1 Type II diabetes and obesity. Research has established a positive correlation between obesity and diseases such as type II diabetes (Ogden, Carroll, Kit, & Flegal, 2014). Nationwide, obesity is now an epidemic. This is evident in headlines such as *The War on Obesity* and *F as in Fat: How Obesity Threatens America's Future* (The Economist, 2014; Trust for America's Health, 2013). These headlines reflect research indicating that in the United States 16.9% of youth and 34.9% of adults are obese. While nationwide rates of obesity have remained constant over the last 13 years, rates of obesity in Alaska have not (Ogden et al., 2014).

According to the Alaska Obesity Facts Report (2014), the rate of adult obesity has doubled from 13% to 27% from 1991-2010. Not only are 28% of people in Alaska obese but 37% are overweight meaning that a combined 65% of the Alaskan population is either overweight or obese. If trends in Alaska persist, then this number will continue to steadily rise. Obesity and the diseases that obesity causes are a huge drain on Alaska both economically and socially.

The Alaska Obesity Facts Report estimates that Alaska spends 459 million dollars each year on expenses directly related to obesity. In Diabetes Facts: *The Diabetes—Obesity Link* (2009), a factsheet developed by the Alaska Division of Public Health, health care for people with obesity costs nearly $2,000 dollars, or one-third more a year compared to people who are a healthy weight. If trends of rising obesity continue along the same trajectory, Alaska Obesity Facts Report (2014) estimates that by 2030, the state will spend 387 million dollars in Medicaid contributions for direct medical costs related to obesity. The total estimated state and federal contribution is 684 million dollars. Cunningham, an associate professor in the College of Health at the University of Alaska Anchorage, opines that, "needed are public education programs promoting nutritional changes in what many Alaskans eat resulting in the obesity epidemic…needed is a more holistic approach that not only includes the use of vitamins but also major diet change," (Cunningham, 2016). By reforming diet, Cunningham believes that the state of Alaska can reduce health care costs. Not only are health problems related to obesity a huge medical expense, but they also cause indirect expenses as well.

Diabetes Facts: *The Diabetes—Obesity Link* (2009) states that 46 % of Alaskans with diabetes have a disability. This is more than twice the percentage of Alaskans without diabetes.

The percentage of Alaskans with diabetes that is unable to work is 10%. The high rates of disability and inability to work creates a dependence on governmental assistance.

Not only does obesity create a financial burden on the state of Alaska, but it also causes social problems. Diabetes has been the 7th leading cause of death in Alaska since 1996 (Diabetes Facts: The Diabetes-Obesity Link, 2009). Alaska faces a crisis: more than half of its population is either overweight or obese. Almost a third of the population is obese. Obesity is a predictor of type II diabetes which causes health complications and can lead to death. Obesity is creating social stressors for those who are confronted with their own poor health or the poor health of their friends, family, and employees. Obesity is prevalent in Alaska, and it is also preventable.

School gardens are one of the potential solutions to decrease the occurrence of obesity. School gardens have the potential to do this through their ability to influence children's preferences regarding fruits and vegetables.

1.4.2 The relationship between school gardens and increased willingness to eat fruits and vegetables. Alaskans are faced with a unique challenge to consume fruits and vegetables. The short growing season and long winter means that seasonal fresh fruits and vegetables are only available from May-September, with an even smaller window of availability in the more northern latitudes of the state.

Rural Alaska is also faced with an added barrier of limited availability of fresh fruits and vegetables in stores combined with higher prices (Snyder & Meter, 2015). These factors have contributed to the statistic that more than three-quarters of adult Alaskans do not eat the recommended five servings of fruits and vegetables daily.

Children are constrained by the dietary preferences of their caretakers when they are in home environments. However, when they are at school, they are offered two meals a day: breakfast and lunch. Schools have the ability, nay the responsibility, to introduce and encourage healthy dietary options to students. A way of accomplishing this can be through providing the opportunity for student participation in school gardens. School gardens create a positive feedback loop; the more a child is exposed to fruits and vegetables at school, the more likely they are to ask for fruits and vegetables at home. Consistent exposure at school can increase consumption at home (Heim, Bauer, Stang, & Ireland, 2011).

In a 2006 study conducted in two indigenous communities in rural Australia, Viola questioned the efficacy of school gardens as a nutritional education tool. The study, which took place over a six-month period, integrated garden education lessons into key learning areas such as mathematics, English, health and physical activity, science, and the arts. Viola's findings indicate that students who participated in the study had an increased awareness of healthy foods and an expanded concept of what healthy foods are. Kloppenburg, Wubben, & Grunes (2008) state that a child's eating preferences are relatively malleable at a young age. However, a child needs repeated exposure to this food item in order to develop a preference towards it. School garden projects help create the opportunity for repeated and varied exposure to a fruit or vegetable.

Participation in school gardens has the capacity to positively influence children's willingness to try new fruits and vegetables. This is corroborated by a study of 111 third and fifth graders representing five schools suggested an increase in positive attitudes towards trying fruits and vegetables. However, the garden intervention did not make a difference regarding self-

reported eating behavior (Ozer, 2007). Ratcliffe et al. (2011) confirm that garden based interventions increase student's ability to identify vegetables, increase the amount of vegetables they can identify, increase their preference for vegetables, and create an increased willingness to try vegetables. In addition, middle school-aged children who participated in the school garden intervention reported having tried more fruits and vegetables than those in the control group. Children require repeated exposure to a fruit or vegetable through a variety of methods in order to adopt a preference to fruits and vegetables. When children are not exposed to nutritional education, hands-on learning experiences, and the regular opportunity to try fruits and vegetables, their eating patterns are unlikely to change.

1.4.3 School gardens improve resiliency. In addition to having the potential to reduce obesity by addressing children's preference for fruits and vegetables through exposure to fruits and vegetables, school gardens also increase community resiliency. Community resiliency encompasses many different sub-topics including nutritional and ecological resiliency.

One aspect of community resiliency is the community's ability to provide for the nutritional needs of its residents. This definition overlaps with Hamm's definition that community food security ensures that all residents are, "Obtaining a culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self reliance and social justice" (Hamm, 2009). School gardens allow a community to move towards enacting this definition through empowering students to try new foods and take control of their own diets. This sense of agency in choosing what to grow and what to eat creates a more socially just nutritional system.

School gardens also provide a gathering place in which community can gather around food. They can bring people together as other communal practices of collecting food decline due to unpredictable weather patterns, decreased sea ice, and increased distances necessary to travel in order to hunt. Procuring food, once a communal activity, is being replaced by shipments of non-perishable goods (Loring & Gerlach, 2009). School gardens have the capacity to bring the community back to food (Ozer, 2007). Loring and Gerlach (2009) comment that participation in preparation of food can "serve as a rich source of story and a premise for sharing celebration, and the maintenance of traditions." (p. 472).

Along with creating an opportunity for new rituals formed around communal food sharing, school gardens create an invitation for parent participation. Parent participation in their children's education promotes a higher level of buy-in to the school (Ozer, 2007). School gardens provide an opportunity for children whose parents may not feel comfortable becoming involved in the classroom to use their skills in the garden.

Chawla et al. (2014) cast community resiliency in ecological defining it as, "the adaptive capacity of natural systems to maintain biodiversity and life-sustaining functions despite change" (p. 2). From this perspective, resiliency is a community wide attribute which then trickles down to the individual. The authors propose that in order for individuals to become more resilient, the ecosystem in which they live must also be resilient.

A resilient ecosystem, one that has a healthy balance of green spaces, can cushion individuals from life's challenges such as stress, anxiety, and depression which can lead to adverse community health effects. Youth with high levels of stress and anxiety are at risk for suicide and mental disorders (Chawla et al., 2014). With levels of stress and anxiety on the rise,

it becomes increasingly important to build a healthy environment. Chawla et al. (2014) propose that young people with access to green spaces are able to better cope with stressors and are capable of more focused attention. They set about to prove this by designing a study in which green spaces, including school gardens were introduced into the daily routines of six school sites.

Findings from interviewing students at a high school site that hosted a school garden indicate that students felt as if they were a key player in an important system, felt peaceful, and connected to others. One 17-year-old student reports, "I like it because I know it all works together, just a big old complete cycle. It calms me down. It makes me feel relaxed, at ease. It reminds me of who I am, and I don't have to worry about anything else" (Chawla et al, 2014, p. 9). Participation in the school garden creates a feeling of connectedness and worthiness that increases individual resiliency.

Not only do students report feeling less stress and a sense of peace, but they also experience increased attention spans. 98% percent of students who participated in the garden reported that they experienced an increased ability to focus that positively impacted their ability to complete schoolwork (Chawla et al., 2014). Ozer (2007) corroborates these findings by noting that, "there are observations of school gardens promoting students' achievement, motivation to learn, psychosocial development (e.g., self esteem, responsibility), behavioral engagement, and cooperation with peers" (p.851) An increased level of focus and well being contributes to school garden participation's efficacy in increasing test scores.

There has been a trend in food-security literature to move beyond one-size-fits-all approaches to a nuanced approach that recognizes every case as unique. School gardens fit in to this approach of increasing food security in a community through a variety of means (Loring &

Gerlach, 2009). Just as one size does not fit all, school gardens are not a viable approach for all communities. Each community must assess its unique circumstances including geography, culture, willingness, history of agriculture, and resources. For example, Sitka, Alaska, located in the southeastern part of the state, has developed a thriving Fish to School program that reflects the culture and available resources in the community

1.4.4 School gardens increase test scores. There is a strong link between nutrition intake and intellectual output. Increasing consumption of fruit and vegetables not only decreases obesity and risks for type II diabetes, but it also can improve children's academic performance. In a survey of school garden based education, Berezowitz et al. (2015) found significant improvements in math test scores and science achievement scores.

School gardens provide students with a hands-on way to reinforce lessons taught in the classroom. Teachers are not the only stakeholder taking note of the potential to improve test scores through use of school gardens. In a large scale survey of principals of California schools with school gardens, 69% of principals thought that garden based curriculum was moderately to very effective at improving science scores (Graham, Beall, Lussier, McLaughlin, & Zidenberg-Cherr, 2005).

School gardens are being used as a means of responding to the alarmingly high occurrence of overweight and obese children by increasing fruit and vegetable consumption and nutritional awareness. Gardens are also being used as a tool to increase test scores and build community resilience. All of these benefits are interconnected, as obesity is linked to lower test scores and is an indicator of vulnerable community resiliency.

School gardens have risen in popularity throughout the lower 48 due partially to the proclamation of former California superintendent of education, Delaine Eastin, calling for a school garden in every school. However, Alaska faces unique challenges that are not present elsewhere. In order to understand these obstacles, as well as to understand how gardens fit in to the greater Alaskan agriculture movement, it is necessary to understand the history of agriculture in Alaska.

1.5 History of Farming in Alaska

The need for commercial agricultural development in Alaska arose with the rush of prospectors during the gold rush beginning in the late 1890s. Up until this point, Native Alaskans met their nutritional needs through hunting and gathering. The new, permanent settlements swelling with people intent upon finding gold created a caloric demand that necessitated agricultural development.

Initial exploration of agricultural capacity was very hopeful (Shortridge, 1976). Professional authorities even thought that Alaska might become a new grain basket that would export to the Lower 48. With demand for agricultural goods rising due to the influx of population, the high costs of transportation, and the optimistic projections for agricultural success, what caused agricultural development in to develop much slower than expected? This section will review the political and economical forces that shaped the agricultural industry, successes and failures, and the current agricultural landscape.

1.5.1 Political and Economic Forces. Initial projections of agricultural potential in Alaska were very optimistic. John Muir visited Alaska in an exploratory journey in 1879. He waxed romantic about the natural beauty as well as the abundant grasses that would be well

suited for grazing. He likened the vast expanses to the prairies in Texas and the old West (Meter & Goldenberg, 2014). In 1926, Alaskan territorial governor George Allen Parks stated, "There is absolutely no reason why, with the extension of the acreage under culture, Alaska should not produce all the flour that is needed for home consumption and in the course of time have a surplus for export" (Shortridge, 1976). From the beginning, those with intimate knowledge of Alaska felt hopeful that the agricultural industry, including animal husbandry and horticulture, would take root and flourish.

Despite such rampant optimism, early attempts at commercial agriculture were stymied by a lack of transportation infrastructure. Dreams of commercial agricultural viability were piqued when the Alaska Railroad company announced plans to begin construction. The primary intention of the Alaska Railroad company was to transport coal around the state. Its secondary use would be for moving agricultural goods. When conservation efforts paused coal mining in 1906, the Alaskan Railroad Company ceased construction. Without a means of transporting goods throughout the state, the nascent agricultural industry stagnated. Construction resumed in 1914, once again providing hope that an agricultural industry would flourish (Shortridge, 1976).

1.5.2 Failures. World War I, beginning in 1919, further stymied agricultural growth and development that seemed imminent with the construction of a railroad system. The White population decreased from 36,400 in 1910 to 27, 883 in 1920 (Shortridge, 1976). The economic slump and agricultural stagnation deepened with the onset of the Great Depression in 1929 and did not pick up again in Alaska until the onset of World War II (Meter & Goldenberg, 2014; Shortridge, 1976).

Governor Jay Hammond took office in 1974 and vigorously attempted to revitalize the state's commercial agricultural market. He created the Alaskan Agricultural Action Committee (AAAC), a taskforce charged with managing current agricultural projects as well as identifying and creating future projects. All current and future projects were to meet five key needs for agricultural investment paraphrased from Davies (2007):

1) a need to develop renewable resources
2) a need to develop industries that provide a satisfying lifestyle to Alaskans,
3) a need to increase food security,
4) a desire to develop agricultural as a means for protecting the rural lifestyle,
5) a way to demonstrate sound investment of oil revenue

The AAAC, charged with pioneering Alaskan agricultural development, identified and managed the following projects: Delta I and Delta II barley project, the Seward grain terminal, and the Point McKenzie Agricultural Project. The AAAC also developed the Agricultural Revolving Fund which offered agricultural loans to entrepreneurs. In total, the state invested approximately 112 million dollars in agricultural products from 1978-81 (Fay, 2003).

The Delta grain project was a failure with cash receipts from 2005 barely higher than those from 1975 (Davies, 2007). The Seward grain terminal was never completed, and the Point McKenzie project ultimately failed in part because of disputes over legal land ownership as well as a lack of demand (Meter and Goldenberg, 2014). Many of the loans administered through the Agricultural Revolving Fund ended in bankruptcy, resulting in state ownership of under-functioning businesses (Fay, 2003). The AAAC was dissolved in 1984 due to its poor economic track record.

1.5.3 Successes. There have been some failures with state agricultural investments, demonstrating the challenges of agriculture in Alaska. The High Tunnel Program, however, has been very successful. Growers in Alaska are constantly trying to increase the season through adaptive techniques such as starting seeds in partially underground spaces where air is warmer, converting living spaces into a seed starting nursery, and covering crops with row cover. The high tunnel is yet another way to add length to the naturally short growing season. High tunnels were first subsidized in Alaska through the 2010 Farm Bill that appointed the responsibility of administering the High Tunnel Program to the National Resource Conservation Service (NRCS). The program reimburses eligible candidates for their costs of ordering and erecting their high tunnel kit (M. Voehler, personal communication, February 9th, 2016). While high tunnels present an exciting opportunity, little research has been conducted about how they interplay with the Alaskan climate. As per research primarily based in the Lower 48, high tunnels were thought to add two to four weeks to the growing season (Monitoring Impacts of High Tunnels, n.d.). As high tunnels gain momentum, so too does the thirst for knowledge about their efficacy in Alaska.

A 2015 high tunnel comparison study conducted in Homer, Alaska located on the shores of Kachemak Bay on the Kenai Peninsula, found that the high tunnel alone did not extend the growing season (Homer High Tunnel Data Comparisons, 2015). Night time temperatures were similar both inside and outside the tunnel. In order to prevent hard frosts from damaging plants, growers still needed to cover crops with a row cover. The high tunnels, do, however, optimize growing conditions during the season. Increased day time temperatures allow growers to maximize speed of plant growth as well as experiment with growing crops such as tomatoes, cucumbers, squash, and corn that were not previously possible to grow outside.

Overall, growers in Homer have been very satisfied with opportunities that high tunnels offer. The Kenai Service Center, which covers Southeast Alaska, the Kenai Peninsula, Bristol Bay, and Kodiak boasts 396 high tunnels followed by the Central Hub which covers Wasilla, Palmer, and Anchorage at 147 high tunnels, and the Northern Service Center which covers Fairbanks and Delta at 78 (Service Center Practice Summary, 2016). More than extend the season, high tunnels allow farmers to produce a higher yield and a more diverse product. Meg Mueller, the NRCS Kenai district conservationist says in a 2014 article published in Homer News says, "It is quite popular and proven useful," (Sullivan, 2014). Since their availability to Alaskans through the Farm Bill, the high tunnel has become a ubiquitous feature on farms throughout the state.

1.5.4 Current agricultural landscape. Alaska was once seen as a land of agricultural potential; a land on the precipice of producing incredible bounty. Unfortunately, those predictions have remained largely unfulfilled. As of 2015, the estimated population of Alaska is 736,625 people (Population Estimates, 2015). Of the total population, there are 762 farmers. Of the 762 people currently farming, less than 30 are American Indian or Alaska Native farmers (Stevenson, Alessa, Kliskey, Rader, Pantoja, Clark, & Giguere, 2014). The percentage of people farming in Alaska is .1% which is considerably lower than the 2% national average of farmers (Fast Facts about Agriculture, n.d.).

Alaska has grown and developed, experienced successes and failures; yet the need to develop sustainable agricultural practices has not diminished. This need is driving current agricultural policy. Inventive and creative entrepreneurs are applying their local knowledge to create thriving farms. Although past agricultural endeavors have seen some challenges, the

agricultural sector continues to innovate in order to meet current needs. There is still potential for agricultural development, a need to provide for fruits and vegetables internally, and a small but thriving agricultural community. However, there is recognition of the importance of increasing food security and building a resilient agricultural community evident through the work of the Alaska Food Policy Council.

The Alaska Food Policy Council recognizes there is a need to increase food security and is taking action. They formed in 2010 and became a 501(c)(3) non-profit in 2014, and their vision is to help build, "A healthy, secure, food system that feeds all Alaskans" (Alaska Food Policy Council, n.d.). In order to make this vision a reality, the Alaska Food Policy Council works on promoting policy change, facilitating research regarding Alaska's food systems, forming working groups to address core issues, and creating open channels of information sharing through their Blog and Facebook pages. In collaboration with the Alaska Food Resource Development Working Group (AFRDWG), the Alaska Food Policy Council has also participated in Town Hall meetings in which residents are able to participate in facilitated focus groups in order to produce local information.

In addition to the Alaska Food Policy Council, the House Bill 70 (HB 70), which was passed in 2010, creates inroads for increasing Alaska's food security. A summary of HB 70 (Alaska House Bill 70, 2009) highlights the following points:

- To increase agricultural production through assisting those desiring to engage in agricultural activity with educational resources
- To negotiate for the marketing of Alaska Grown to federal and state agencies
- To create the Farm to School program and establish an annual budget

- To coordinate procurement of local foods with schools, assist farmers with connecting to schools and schools to connecting with farmers, and support efforts including school gardens, school farms, and farm visits
- To authorize school districts to open school gardens, farms, and greenhouses for educational purposes.
- To produce fruits and vegetables from school gardens, farms, and greenhouses that are then used in the school district's meal and snack program

Agricultural education in Alaska is the foundation that will support the success of the new movement towards building a sustainable agricultural sector. The Alaska Department of Health and Social Services commissioned Meter and Goldenberg (2014) to create a list of recommended actions in order to support the agricultural sector as they state, "By 2034, every graduating high school senior shall hold basic skills in gardening, foraging, composting, safe handling, food preparation, and storage" (p. 143). In addition, they suggest that, "a culture of food production should be nurtured that brings Alaskans together to learn about growing, gathering, preserving, preparing, and savoring good food…to form social bonds across generations that celebrate place" (p. 144).

As mentioned in the previous section, agricultural education that is integrated into curriculum in combination with hands-on learning experiences provides a myriad of benefits including increased test scores, increased community resilience, and an increased willingness to try fruits and vegetables. The final and perhaps most important benefit they provide is a means of insuring that Alaska will have farmers in the future that weave together the past and present in order to create a narrative of community resilience, health, and well-being.

Paragi, Gerlack, & Meadow (2010) have stated that they:

> Expect that it will remain difficult to engage rural and urban public or government in serious discussions about agricultural policy until the price of food becomes a substantially larger (even prohibitive) proportion of annual income for Alaskans, or until major disruptions in transportation increase the frequency and magnitude of local regional food shortages (p. 37).

Research indicates that agricultural education including school gardens is a means of building capacity. Developing school garden programs requires sustained long-term investment. As the state of Alaska faces budget cuts effecting programs that support agriculture, sustaining investment will present a challenge. In order to avoid the cultural devastation that will ensue if Alaska waits until its populace is forced out of their communities due to food shortages, the state needs to find a way to continue supporting agricultural education through sustained investment.

However, Alaska faces many challenges to increasing agricultural production, including a short growing season, off-road communities, a small demand, and a state economy based on oil revenue. Alaska rides a wild roller-coaster of booms and busts. The current budget crisis has forced the state to make tough financial decisions that affect the agricultural industry. The state's decisions are at odds with the need to increase agricultural development to build resiliency. Agricultural education and school gardens increase community resiliency (Chawla et al., 2014; Hamm, 2009; Ozer, 2007). In order to continue advocating for school gardens and other agricultural education programs, it is important for researchers to continue investigating the varied forms of agricultural education currently in use in Alaska.

Chapter 2: Literature Review

The essential function of Diffusion of Innovation Theory (DIT) is to study how a given innovation spreads over time, with specific attention to the role of social networks and communication channels. Diffusion usually takes an 'S' shape curve over time with a period of sluggish diffusion in the beginning, rapid diffusion as it becomes popular, and again sluggish diffusion as the innovation is either saturated or discarded. Diffusion research is most common among several fields, one of which is Communication. The field of Communication is a versatile discipline that has the flexibility to "analyze any particular type of innovation" (Rogers, 1983, p. 73). In fact, communication scholars often employ survey and interview methods, just as I do, in order to complete diffusion studies.

2.1 Diffusion of Innovation Theory (DIT)

Rogers (1983) has coined many terms in order to explain the diffusion of innovation process. He defines diffusion as the rate at which an innovation, or an idea that is perceived as new, spreads over time. DIT practitioners divide the innovation-decision making process into five steps in order to look closely at the five steps involved in the innovation-decision making process: (a) knowledge of the innovation; (b) persuasion to consider the innovation; (c) decision to accept or reject; (d) implementation; (e) confirmation of the utility of the particular innovation (Rogers, 1983).

Rogers (1983) also uses specific terms to define the five categories of people that adopt depending when they choose to adopt as well as those that influence adoption. Those that are first to adopt are labeled as (a) innovators followed by the (b) early adopters. The (c) early

majority is followed by the (d) late majority and ends with (e) laggards. Most of those who participate in the diffusion of ideas are often initially informed by change agents, representatives from an organization who advocate for an innovation, and later influenced by opinion leaders, members of a community who command respect. Rogers (1983) defines degrees of difference or similarity in terms of homophily and heterophily. Higher degrees of homophily or similarity between the change agent and the opinion leaders and the opinion leaders and the potential innovators will result in more rapid degrees of change. In contrast, the higher degree of heterophily or difference between the change agent, opinion leader, and potential innovators will result in lower rates of diffusion.

In addition, Rogers (1983) defines communication channels as the way in which a message is transmitted from a source to a receiver, play a large role in the diffusion of innovations. He further explains that interpersonal channels, which are defines as face-to-face communication between two or more individuals, play important but different functions in spreading an idea. Mass media as a channel is especially effective in the knowledge stage, which is the first stage of adoption. Mass media has the ability to rapidly spread knowledge, reach a large audience, and has the potential to change people's weakly held attitudes. In contrast interpersonal channels are more effective during the persuasion stage which is the second stage of the innovation-adoption process. Interpersonal channels reduce uncertainty between individuals and are effective in dealing with, "resistance or apathy on the part of the communicatee" (Rogers, 1983, p. 198).

One could study the diffusion of diffusion research and note that there was a significant pause between the innovation and *adoption* stages. Scholars began studying diffusion in the early

1900s. Gabriel Tarde, a French sociologist, published a groundbreaking book in 1903 titled Laws of Imitation shortly before his death in 1904. Concurrently, British and German anthropologists were beginning diffusion research in the field of anthropology. It was not until Ryan and Gross published their pioneering studies in the field of rural sociology that DIT became a popular theoretical paradigm (Rogers, 1983). Since then, the numbers of scholars contributing to diffusion research has steadily increased.

2.2 Limitations of DIT

Rogers (1983) outlines three major limitations of DIT: (a) pro-innovation bias; (b) individual blame; (c) calcified research methodologies. Pro-innovation bias refers to the assumption imbedded in many studies that innovation is beneficial. This idea has been propagated due in part to the source of funding for diffusion studies. Oftentimes studies are sponsored by change agents that represent the creators of an innovation. I acknowledge this bias and attempt to mitigate it by exploring the potential downsides of the spread of agricultural education in the discussion section of this document. In addition, this project is not inherently biased by a funding source.

The pro-innovation bias assumes that adoption is in the best interest of a given population. Those who do not choose to innovate or are slow at innovating tend to be labeled as "backwards" or "unsophisticated". This is reinforced in the very language used in DIT by negatively labeling those that are slowest to innovate as "laggards". However, Rogers (1983) points out that, "whether considered right or wrong by a scientific expert who seeks to evaluate an innovation objectively, an adoption/rejection decision is always right in the eyes of the individual who is making the innovation-decision (at least at the time the decision is made)" (p.

100). An innovation may have positive societal benefits but be undesirable for an individual based on very specific set of circumstances. In addition, the choice to innovate may be constrained by system level challenges such as a lack of financial incentives, a high level of risk, and a low level of available information.

The final limitation of DIT is its lack of theoretical scope. DIT often examines how innovation has spread by looking at diffusion as a dependent variable and factors of diffusion as independent variables. Researchers often overlook the question of why people adopt an innovation. Additionally, research is focused on successful diffusion instead of looking at factors for why diffusion does not spread. This study represents a deviation from the standard DIT study in that it focuses on a diffusion that is in the process of occurring. This study also employs loosely structured interviews that allow for deeper understanding of practitioner's motivation at each site.

The following section draws upon information from studies of innovation diffusion that range from minimal success to overwhelming diffusion in order to pull information that could be applied to the diffusion of agricultural education in Alaska. The following three case studies examine diffusion of innovations that are still in process. The first innovation examined is the (a) diffusion of organic agriculture followed by the (b) diffusion of Fair Trade and concluding with the (c) diffusion of innovations concerning climate change mitigation. An analysis of successes and failures will lend insight into what could encourage the diffusion of agricultural education in Alaska. However, it may not be appropriate for all schools based upon individual circumstances. Agricultural education is not a one-size-fits-all innovation suitable to all circumstances.

2.3 Case Studies

2.3.1 Diffusion of organic agriculture. The use of DIT increased exponentially after Ryan and Gross's seminal study of the diffusion of hybridized corn seed, a technique of conventional agriculture. Somewhat ironically, as DIT became a popular theory to examine conventional agriculture, others started using it to study the proliferation of organic agriculture.

The organic agriculture movement draws upon both ideology and practice. It is a movement that draws upon, "modern agricultural practices based on up-to-date scientific knowledge or integration of modern scientific knowledge with the indigenous knowledge of local farming practices and circumstances" (Simin & Jankovic, 2014).

The organic agriculture movement evolved in response to the widespread diffusion of conventional agriculture technologies known as the Green Revolution. The Green Revolution was ushered into history on the coat tails of World War II in response to global hunger and wartime technological innovation. The solution was to convert technology once applied to producing synthetic chemicals for use in waging war towards making herbicides, pesticides, and fertilizers in order to increase agricultural production (Simin & Jankovic, 2014). Other companies that produced large machinery for the war effort began making tractors and other large farm implements. Essentially, the Green Revolution is the conversion of the war machine into agriculture.

This conversion enabled farmers to produce more food by using synthetic herbicides, pesticides, and fertilizers as well as mechanizing tasks previously performed by hand or using animals. In the short term, the Green Revolution was a widespread success. However, it did not come without consequences. Pingali (2012) is generally supportive of the Green Revolution but

concedes that "unintended consequences in water use, soil degradation, and chemical runoff have had serious environmental impacts beyond the areas cultivated." Fitzgerald-Moore and Parai (1996) further explain that the use of chemical herbicides and pesticides also reduces the soil's resistance to disease through reducing naturally occurring organisms. Once hailed as the antidote to world hunger, the unintended consequences of the Green Revolution have paved the way for a new innovation: Organic agriculture.

The review of diffusion of organic agriculture studies lends valuable insight into the surprising reasons why this innovation has spread. The switch to organic agriculture provides requires a paradigm shift accompanied with the acquisition of new skills, and a delay of gratification during the transition from conventional to organic methods. Nevertheless, farmers are making the shift towards organic practices. Results from the United States Department of Agriculture's Organic Survey on organic agriculture indicate that there are currently 14,093 organic farms in the United States grossing a total of $5.5 billion dollars (United States Department of Agriculture (USDA), 2016)).

Rogers (1983) states that individuals become more psychologically involved in the persuasion stage. Parra-Lopez, De-Haro-Giménez, and Calatrava-Requena (2007) notice that early adopters of organic olive production in Spain were motivated to convert to organic practices because of ideological reasons such as the environmental benefit of organic agriculture. During the persuasion phase, they reduced uncertainty by relying heavily on informal sources of information. Cannarella and Piccioni (2010) also observe that farmers are choosing to convert to organic practices because of their belief system even though organic agriculture does not produce immediately quantifiable benefits.

Organic agriculture practices produce results on a slower time-scale than conventional agriculture. The quantifiable benefits such as lower input costs are often negated during the transition from conventional to organic by lower yields. Meanwhile, the myriad of other benefits such as reduced individual exposure to chemicals, increased soil resistance to disease, increased ecological biodiversity, and natural pest resistance from increased biodiversity are only evident over time. This is similar to agriculture education in which the benefits are difficult to measure in the short-term.

One of the most obvious initial losses that farmers feel in making the switch to organic agricultural practices is financial. Organic accreditation is expensive, crop yield may decrease while soil rebuilds natural fertility, and the knowledge gap between conventional and organic practices is large. Simin and Jankovic (2014) state that in order for diffusion to occur, there must be sufficient financial resources. The diffusion of organic agriculture is occurring at a much slower rate than the diffusion of conventional agriculture in part because conventional agriculture has received more financial support both from the U.S. government as well as private corporations. Financial security is an important factor in farmers' decisions to continue using conventional agriculture practices. While barriers to innovation have slowed the diffusion of organic agriculture, the adoption of organic practices continues to spread.

A big break-through in understanding the diffusion of organic agriculture occurs when realizing that ideological reasons motivate individuals just as powerfully as economic reasons during the persuasion stage of decision making. While farmers are motivated by concrete and observable successes, some view success in terms of environmental protection as well as in terms of potential future profit.

Another key finding is that farmers turn towards one another more often than they turn towards scientific reports (Parra-Lopez et al., 2007). The decision to adopt new practices creates a high level of uncertainty about whether or not the decision will be beneficial. Instead of turning towards official channels of communication, farmers rely upon the opinions of their neighbors who have already innovated. Those that have innovated would be considered opinion leaders (Rogers, 1983) and command a high degree of influence over their peers. If they have a favorable opinion of the innovation they have adopted, then it will continue to diffuse.

Organic agriculture existed before the Green Revolution in the form of rural peasant agriculture. After the aforementioned ecological effects of the Green Revolution became apparent in the 1960s, a new organic agriculture movement emerged. This movement was based heavily on the ideology of ecological responsibility as well as pragmatism. The organic agriculture movement is still in the process of diffusing. It is hindered by there being few financial incentives to adopt. At the same time, it is aided by a strong ideological following and success at fostering ecological reparation while producing nutritious foods.

Many of the same challenges present in the diffusion of organic agriculture are also present in the diffusion of agricultural education. The choice to adopt agricultural education is accompanied with very few financial incentives. It too requires a paradigm shift in viewing education. Further it necessitates learning new techniques for teaching in the garden. Like organic agriculture, agricultural education has an ideological component that contributes to the decision of whether or not to adopt. The lessons we can distill from an examination of organic agriculture are: Minimal financial incentives slow but do not stop diffusion, ideological support

plays a large factor in the decision to adopt, and peer-to-peer communication is more effective at reducing uncertainty than information published by official sources.

2.3.2 Fair Trade. Fair Trade is another innovation steeped in both ideology and pragmatism. Gurviez and Sirieix (2013) point out that some, but not all, consumers choose to partake in purchasing Fair Trade products for ethical reasons. Fair Trade focuses on shifting the international trade paradigm away from focusing purely on profits to encompassing both profits and the human experience of producing and consuming products. The objectives of Fair Trade are to "establish conditions to raise the standard of living and the social environmental security of the producers and their families" (Gurviez & Sirieix, 2013, p. 1). Fair Trade is a social innovation and a form of activism that exists within the commercial sphere.

Fair Trade is in the process of diffusion and has faced significant obstacles. One of the major stumbling blocks of Fair Trade is that it is, "an activist movement that nevertheless lies firmly within the commercial sphere" (Gurviez & Sirieix, 2013, p.1). This creates cognitive difficulties for participants of Fair Trade who support the idea but have difficulty integrating the concept into their original framework of minimizing costs. Another difficulty within the Fair Trade movement is disunity amongst participants regarding their reason for participation. While some consumers buy Fair Trade products because they believe in the ideological underpinnings of the movement, others simply purchase products because they prefer the flavor. A lack of unity around the motive for participation in Fair Trade presents a challenge to craft a message that can efficiently address the first two stages of DIT: knowledge and persuasion. Without a clear and concise message that summarizes the utility of an innovation, it is hard to persuade users to participate.

The school garden movement, like the Fair Trade movement, seeks to, "infuse organizational fields with new, regenerative and innovative values and practices" (Schwartz, 2010, p. 7). Although the Fair Trade movement is primarily a business model, it does have similarities with the agricultural education movement. Both movements are attempting to modify a pre-existing system. Both movements seek to create change whether it is increased preference for fruits and vegetables are a higher profit margin for producers. Due to overlapping similarities, both movements also share two primary stumbling blocks. The first challenge is found in fitting an agricultural education program into the existing structure of the school system. Schools have a very specific curriculum they must cover and academic goals they must achieve in order to prepare students to score well on standardized tests. The rigidity present within the existing school system can create challenges to integrating an agricultural education program.

The second challenge lies in convincing stakeholders to support the movement. The Fair Trade movement must first educate the consumer base about the relative merits of buying Fair Trade products just as the agricultural education movement must convince administrators, teachers, parents, and youth of the benefits of participation. Though the two movements have core differences, the Fair Trade experience can provide insight into the agricultural education movement. The challenges that the Fair Trade movement faces can help us better understand the challenges that the Farm to School movement also faces.

2.3.3 Climate change and alternative energy. Alternative energy is another form of social entrepreneurship that is in the process of diffusing. Poor air quality, concern for the environment, and projections regarding the inability to obtain cheap oil in the future have all contributed to the push towards adopting alternative energy. The movement towards adopting

alternative energy, like the agricultural education movement, has both pragmatic and social motivations. Matisoff (2008) opines that there will be a direct relationship between the need for alternative energy due to shared downsides (poor air quality, ecological destruction, and high costs) and the desire to adopt alternative energy technologies. Matisoff continues to explain that the decisions to adopt alternative energy technologies are a function of motivations, resources to allow adoption, and obstacles that prevent adoption.

Lilly (2009) examines these motivations, obstacles, and available resources in a study of adoption of technological innovations to mitigate climate change such as recycling, solar power, wind power, and hybridized vehicles. This investigation illuminates both challenges to diffusion and successful strategies to increase adoption.

The primary obstacles that appear are high levels of uncertainty, challenges in communicating information, low levels of motivation, and the need for stronger incentives. The U.S. Department of Energy estimates wind power to have the capacity to supply 20% of U.S power by 2030. Despite this optimism, studies conducted in India reveal that states must promote public knowledge for diffusion to occur (Lilly, 2009). Like water to a plant, knowledge is necessary for the seed of innovation to flourish.

An ample knowledge base is necessary in order for innovation diffusion to proceed to the persuasion stage. Lack of knowledge leads to high levels of uncertainty, which can be, but are not always successfully, countered with more information. In the case of hybrid cars, the persuasion stage was aided through, "increasing communication through website promotion and media development" (Lilly, 2009). However, the most successful way of countering uncertainty

is through peer-to-peer information exchanges. Uncertainty is reduced by witnessing respected peers benefiting from their decision to innovate.

The decision stage follows the persuasion stage and can be plagued by a lack of motivation. Research shows that knowledge is not enough to change behavior. People must have knowledge, confidence in the innovation, and motivation to change their behavior before they decide to innovate. Recycling, an innovation that has successfully diffused throughout the U.S., focused heavily on targeting consumers' personal and cultural values (Lilly, 2009). Once these values were isolated, information campaigns were targeted towards addressing what people hold most important to them.

Another important factor in the decision phase is the presence of an incentive. The renewable energy industry has benefited from government subsidies that offset installation costs. Incentives often take the form of monetary compensation though this is not always the case. Incentives can also be socially embedded if they raise the person's perceived social standing. For example, driving a hybrid vehicle may raise an individual's perception of their social standing within their circle. Likewise, a plaque lauding the achievements of a school's agricultural education program may give this school the perception of elevated accomplishment.

Innovations regarding climate change have shown that challenges to diffusion appear in the form of information paucity, poor information packaging, low motivation levels, high uncertainty levels, and weak incentives. These factors slow or halt the diffusion of innovations. In order to overcome these limitations, the focus must be on personalizing information to match the values of consumers, increasing opportunities for peer-to-peer exchanges, increasing availability of information, and creating incentives.

2.3.4 Conclusion. This section reviewed DIT research in three different topics: (a) organic agriculture; (b) Fair Trade; (c) climate conscious practices. An examination of organic agriculture and FT has shown that actors are motivated by many factors, including but not exclusive to monetary gain. In the case of olive producers, the decision to adopt organic agriculture was deeply rooted in ideological concerns (Cannarella & Piccioni, 2010). Diversity of motivators creates disunity thus increasing the difficulty of peer-to-peer information sharing. The FT movement encountered obstacles when trying to market their product necessitating a way to express embedded ideological differences between their product and a conventional product (Gurviez & Sirieix, 2013). When studying the adoption of climate conscious practices, Lilly (2009) found that a shortage of clear and easy-to-understand information along with low motivation has slowed the adoption of climate conscious practices. Research looking at the adoption of innovations through the lens of DIT provides insight that can help understand the process of diffusion of agricultural education. The following section will explore the methods used to conduct this investigation of agricultural education.

Chapter 3: Research Methods

> "[Researchers] do not have to try to play God, writing as disembodied omniscient narrators claiming universal and a temporal general knowledge."
>
> Richardson & St. Pierre (as cited in Creswell, 2013, p. 961)

3.1 Research Paradigm

My work is grounded in the interpretive school of thought, though it is also guided by pragmatism. Pragmatism emphasizes the use of multiple modes of research to answer a given research question (Creswell, 2013). An approach from the interpretivist perspective favors qualitative research (Brinkman & Kvale, 2015; Creswell, 2013). In this research study, I employ both interview and survey methods. I seek to approach a question with multiple research methods in order to create a multi-dimensional level of understanding.

The purpose of conducting a survey is to reach a wider audience than is possible through interviews. The survey data is also used to question whether themes occurring in the Fairbanks area are also reflected throughout the state. Both similarities and differences in themes provide valuable insight. While conducting interviews, I to understand the subjective experiences of each participant. Use of this perspective highlights the importance of individual experience while acknowledging that no two individuals hold the same meaning regarding a given event. Approaching the nature of reality from an interpretivist perspective necessitates capturing the essence of the respondent. One way to do this is to create unstructured interviews. An unstructured interview allows the respondent's perspective to steer the course of the interview instead of the interviewer imposing their perspective on the interviewee (Creswell, 2013). I take a modified approach and use a semi-structured interview style where I have certain themes that I

want to discuss, but let the interviewee guide the conversation. This allows me to gather knowledge on specific subjects while also allowing the respondent to carry the conversation into topics that I may not have know about or would not have otherwise probed.

This project was meant to be inductive meaning that the starting point of inquiry is with the data: interviews and a survey. However, the process evolved into an iterative approach in which new information challenged original assumptions. For example, further research regarding the structure of organizations that support agricultural education throughout the state has resulted in an ongoing shift of which organizations to study and how to represent them. Another example is found in the selection of theory, which guides the interpretation of data as well as provides insight into what type of questions to ask. The choice to use DIT as a theoretical framework emerged after the first two interviews were conducted. The choice was informed by discernible communication themes that were compatible with DIT. After adopting DIT as a theoretical framework, I was able to identify more potential emerging themes which then informed the questions that I asked of future participants.

A primary axiological distinction between quantitative and qualitative researchers is that qualitative researchers believe that the values of the researcher influence the knowledge produced in a study. Because of this, it is important for the researcher to "position themselves" within the research (Creswell, 2013).

Qualitative researchers must take care to create rigorous studies that are firmly entrenched within their own legitimate ontological perspective. Brinkman and Kvale (2015) stress that validity should be integrated throughout the research process. They have created the following checklist of ethical issues at seven key stages in qualitative research to guide a

researcher: Thematizing, designing, interview situation, transcription, analysis, verification, and reporting. The research design includes these components to ensure that this research study is rigorous and ethical in nature. In addition, I will discuss my own biases and values as a means of positioning myself with this body of research.

3.2 Axiology

The presence of researcher bias is an inevitable part of producing research. Biases are neither good nor bad; they just are. Given that bias exists, it is important that the researcher recognize their own biases and state them for the audience to consider. I work to embed myself within this body of research and make my biases known. The act of writing myself into this work allows the audience to draw their own conclusions based on full disclosure.

My first experience gardening was in the capacity of 'garden intern' in a pre-school classroom in South Tucson. The area was considered a 'food desert' with minimal access to healthful foods. Many of the children in the classroom had never seen fruits or vegetables growing in soil before. Their experience of food was that of a highly processed product coming from bags, boxes, or cans. I witnessed first-hand the expressions of shock and pleasure at the salty taste of chard, or the sweet crunch of baby carrots. I saw children who displayed little interest in classroom learning show immense curiosity and focus with the natural world. I have seen children who have experienced trauma find peace amongst growing plants. I have seen a community fragmented by fear of deportation and lack of resources weave a resilient network of support through connections made while spending time in the garden.

I believe in the potential of agricultural education integrated into curriculum to provide a more accessible learning experience. However, I do not think that every school garden is

effective, nor do I think that all attempts are beneficial. Each space must incorporate local history, culture, traditions, and knowledge. Agricultural education should be a tool for uniting the past and the present to take charge of the future. When it is used to erase or disregard past traditions, it is ineffective.

3.3 Research Design

The qualitative research methods chosen for this study are semi structured interviews as part of a case study as well as a survey. Semi-structured interviews allow for an exploration of the subject's perspective about a topic. A case study allows a researcher to investigate more than one case, answer such questions as *how* and *why* and use multiple sources of information to draw conclusions (Yin, 1994). Yin also states that the research question drives the method which drives the theory. In this case, my research question seeks to understand the how and why making the case study an apt methodological tool.

Brinkman and Kvale (2015) refer to thematizing as the process of picking a research project that improves the quality of "human situation investigated" (p. 85). The intent of this project is to increase knowledge of the successes and barriers present when implementing agricultural education statewide with an emphasis placed on Fairbanks. By increasing knowledge of what works and what does not work, practitioners and policy makers alike can work towards implementing programs that do meet the community's needs.

3.3.1 Mixed methods. Mixed methods provide the best toolset to examine agricultural education in Alaska. The approach towards mixing methods taken for this project is the Triangulation Design, used to find "differing but complementary data" (Creswell & Plano Clark,

2007, p. 62). The concurrent design consists of a single time period for gathering data. I designed the survey at the same time as I designed the interview questions.

Before writing the survey, I was given access to a spread sheet listing all schools that had received a Farm to School mini-grant between 2011 and 2014 as well as whether or not they had a school garden courtesy of the Division of Agriculture. I used this spread sheet to find phone numbers for each mini-grant recipient site. I then called each school and spoke with someone who either gave me the e-mail address or phone number of a knowledgeable point of contact if one was known. After compiling a list of e-mail addresses for knowledgeable points of contact, I sent out the first survey on October 16th, 2015. It was then distributed a second time via e-mail on February 4th to non-respondents and new contacts.

I use a convergence model in which data from qualitative and quantitative data sets have been merged during the analysis section of this thesis (Creswell & Plano Clark, 2007). I give more weight to the qualitative responses because I believe the lived experiences of individuals' offers the best means for explaining what is happening at each individual school site. The rationale for this approach is that the qualitative data affords deeper levels of understanding regarding emerging themes. The survey allows me to access more schools in diverse areas of the state then possible through semi-structured interviews. It also adds richness to the data by allowing for comparison and contrast of findings from one geographic area to the next.

The first interview was conducted on October 13th, 2015 and the last interview was conducted on February 15th, 2016. The participants of the semi-structured interviews were chosen based upon their participation in the four previously mentioned organizational models.

After identifying and interviewing one contact, snowballing was used to identify more contacts within the same school site. All but one interview was conducted face-to-face.

The survey data did not influence the construction of the semi-structured interview data as both methods were created and analyzed at the same time. Each component was conducted in isolation of the other. In this way, I was able to avoid bias that occurs from the results of one component informing the interpretation of the results of the other.

3.4 Selection of the Case

The nature of this study has evolved over time due to geographical constraints. While the original intention was to narrow the focus to the Farm to School program, those parameters have proven to be infeasible. There were only three sites that participated in the Farm to School program in the Fairbanks area, and one of the participants did not respond to multiple requests for an interview. There are many other participants throughout the state, but the unique geographical landscape of this state makes travel a costly and time intensive endeavor. Instead, I opted to focus my attention on four organizations that support agricultural education in this area: FFA, Farm to School, Taproot Community Farm and Learning Center, and a school embedded within a religious community. Participants were chosen based upon their involvement within these four categories as well as their willingness to be interviewed.

The decision to send out a state-wide survey to all Farm to School mini-grant recipients between the years 2011-2014 arose out of the desire to capture data from all around the state. Each school's story is necessary in producing the most detailed representation of the agricultural education scene. One of the primary survey goals was to assess whether schools were able to sustain agricultural education programs in the years preceding the grant. However, the results of

this survey regarding this question are biased in favor of schools that continue to sustain an agricultural education program as schools that had discontinued their program had difficulties providing a contact person for the survey. Regardless, the information gained from this survey provides many insights. This information may supplement the information that the Farm to School program collects the season after issuing the mini-grant.

3.5 Ethics of Human Research

Brinkman and Kvale (2015) bring up the necessity to consider the ethical issues involved in protecting participants' identity and minimizing the possible consequences their participation could have on them. In this study, participant names as well as affiliated organizations have been changed. Consideration was given towards withholding the name of the state in which this research is conducted as well as cities, but ultimately, both geography and place assume an important role.

Alaska is a large state with a very small population base. In order to minimize possible negative consequences of participation, I have submitted each section pertinent to the individual for their review before making public research findings. Ethical research is intuitive and is dependent upon the moral character of the researcher (Brinkman & Kvale, 2015). I strive to honor and respect the people who have generously shared their stories. The intention of representing their stories is to elucidate successes and barriers of engaging in agricultural education.

Cotter (2011), a qualitative researcher, points out that reciprocity is a crucial component of any qualitative research study. Furthermore, Cotter reports that the 2010 research of Dance, Gutierrez, and Hermes (2010) say that reciprocity is, "responding to communities in a way that

goes back and forth" (as cited in Cotter, p. 70). In other words, the researcher as well as the participants must be willing to enter a relationship of give-and-take. In this case, the participants have given me valuable insight into their joys and sorrows, successes and failures, moments of frustration and moments of elation. In turn, I have compiled their stories into a document that can serve as a means of validating one's own experience, learning from other's successes and failures, and ultimately highlighting shared themes that can be used as programs continuously evolve and develop.

3.6 Data Analysis

Each in-depth semi-structured interview was transcribed word-for-word, analyzed for important themes, and then cross-referenced to identify commonalities. This resulted in the emergence of six primary themes. Furthermore, data from the interviews is supplemented by survey data. Survey data was analyzed for descriptive statistics such as mean, average, frequency, and range. In addition, each open ended question was analyzed for themes which are then cross-referenced to identify commonalities.

Chapter 4: Representation and Analysis of Data

There is ample evidence of the positive effects school gardens can have on communities (Berezowitz et al., 2015; Chawla et al., 2014; Graham et al., 2005; Loring & Gerlach, 2009; Ozer 2007; Ratcliffe et al., 2011). However, their initial start-up cost and continued maintenance is a barrier for sustaining existing agricultural education projects and creating new projects. In the following sections, we will hear first hand experiences of school garden practitioners throughout the state. This chapter is divided into a representation of results from in depth interviews followed by data analyses, an analysis of survey data, and concludes with a comparison of both similarities and dissimilarities between the two sets of data.

4.1 Representation of the Data

The semi-structured interview format allows interviewees to steer the conversation towards the topics they view as relevant. They are the experts in their field, not me. Some interviews directly reflect the questions asked while others have meandered down tributaries far adrift from mainstream. Oftentimes, it is in these tributaries where the richest themes emerge. My intention in designing the interview questions was to create enough structure to allow conversation to flow and then have enough discipline not to interrupt as my participants shared their knowledge. Table 4.1 displays contextual details, gathered from the School Overview website (School Overview, n.d.), regarding each school site.

Table 4.1
Contextual Details

	Clear Water	Golden Hill	Crooked Spruce	Quail Run
School Size	149, KG-8	205, KG-12	169, 7-12	459, PK-12
Garden Status	Active, partnered with Taproot	Active, run by the Native Council	Volunteer Coordinated	Active
School Type	Montessori, Charter	Public	Charter	Catholic, Private

4.1.1 Semi-structured interview with Zoe of Crooked Spruce. Zoe is the first person I interviewed. I recall the oddity of arriving to talk to someone about their involvement with gardening during winter, when temperatures discourage spending time outside and the garden is buried in snow. Inside, Zoe's office is packed with boxes containing information on whatever her current project may be. She has a whiteboard mounted on the wall with notes written here and there. I take a seat on a chair next to the desk as we exchange pleasantries and share stories about why we are both a little tired on this chilly morning in October.

Her voice crackles with urgency as she explains to me the history of the school garden and and how she envisions it expanding. When Zoe was hired, the principal at the time, Beverly Carol, had asked her to build a leadership program for students. Her desire to offer school credit combined with her vision to build a program that integrates the garden and the classroom led her towards creating the school's first FFA charter. Zoe says, "I did it for, like, two years. I was a total stress case because I couldn't actually run FFA like it should be run, like an intracurricular program. We tried to do that but…It is just really hard. It's like herding cats for a meeting."

However difficult it may have been, though, they managed to create a program and involve students during lunch meetings. In the fall of 2011, Elena was hired as a special education aid at Crooked Spruce. Zoe quickly saw in Elena a passion for education and an enthusiasm for agriculture. She convinced her to take on the position of FFA coordinator. She said, "You've got to be the FFA coordinator…I have no time, and you have the drive and energy. That's what they need."

Zoe values connections as a way of furthering Crooked Spruce's FFA program. She partnered with the School of Agricultural Sciences and Natural Resources to have them plough their garden. She envisions, "turn[ing] the farm into a certified technical education school for agricultural resources sciences that can run through grades 10-14 so they are leaving with a certificate or an Associate [degree]." Her goal is to partner with UAF to create a career pathway where students can graduate from Crooked Spruce with an Associate degree and either enter the job market or transition into a 4-year degree program at UAF. Cooperation from UAF is not happening as quickly as Zoe would like, and she says with frustration, "If you don't spend a little bit on this community to show that you have an interest in this community and the students that live here, you're not gonna get them."

The road to creating a thriving FFA program has been challenging. Amongst the myriad of struggles is the difficulty in convincing Crooked Spruce's board members that FFA must be integrated into the classroom. Zoe elaborates that, "what the board didn't understand is why we couldn't do it without the classroom. The idea is that you have the classroom component which drives the group of kids to do community service."

In 2015, under the guidance of a new "lead teacher" who takes on responsibilities similar to a principal, the board members of Crooked Spruce voted not to allocate money for Elena to integrate themes from the school garden into formal classroom study. Frustrated at the perceived lack of support for her and Zoe's vision of bringing their FFA program into national alignment, Elena left. Since then, the program has slumped. Last summer, Crooked Spruce did run their garden summer school program, and Zoe is uncertain what will come of the garden this summer. "We're up against the short-term. It's really hard to get beyond that because people want immediate gratification," says Zoe in reference to the decision not to extend support for growing the FFA program. Money, she says, is definitely a barrier.

Another barrier, she says, is the lack of a greenhouse that would enable year-round production. It would also provide a space for students to raise plants for an annual plant sale fundraiser. The greenhouse, she says, would, "Get the program to fly and to really get kids interested. If we could do that, I think our FFA program would be kicking ass." Additionally, she would like to see more emphasis on animal husbandry. "Wouldn't you learn a lot more about biology…if you were learning about those animals?" she questions.

Despite the frustration Zoe feels of seeing the garden program flourish and then wilt, she remains ever hopeful. She actively works to create connections with UAF, holds out hope for a partnership in which Crooked Spruce runs the only Agricultural and Career Technical Education high school in the area, and remains hopeful that the board members will acknowledge the importance of she and Elena's work and hire a full-time teacher that is certified to teach agricultural education.

4.1.2 Semi-structured interview with Elena of Crooked Spruce. When I asked Zoe for more details about the summer garden program that ran from 2012-2014, she recommended that I speak to Elena, who had created the curriculum and directed the program each summer. Elena began working at Crooked Spruce in the summer of 2012 and left in the 2015. She was originally employed to develop the summer garden program but stayed on as a special education aid.

The summer school garden program was in compliance with the Fairbanks Northstar Curriculum standards and thus Crooked Spruce was able to offer ½ a science credit to students per session for a total of 1 science credit per summer. Elena says, "this was great from the standpoint of credit recovery." In addition, she says, "We made money. The garden did really well. The kids had a lot of fun and I was approached by Zoe to take over their FFA program…" Due to the success of the program, Elena was officially hired as a special education aid, though the intention was that she continue to contribute to the agricultural education program.

The principal at the time, Beverly Carol, was enthusiastic about growing the garden program and encouraged Elena to integrate the garden into her work as a special education aid. Beverly, Elena says, was, "onboard with me bringing as much garden stuff into the classroom as I felt would be helpful." In the fall of 2012, Zoe asked Elena to take over the FFA program.

As FFA coordinator, Elena held meetings during lunch and coached students through developing supervised agricultural experiences (SAEs). She also held fundraisers to raise money for the FFA chapter. Every Friday, the FFA kids would sell baked potatoes with chili and sour cream for five dollars a potato. It was a constant stream of money for the FFA chapter as well as a needed healthy snack. Elena noticed that students had, "This considerable slump in the afternoon where kids were just not feeling it, and, like, I can't tell you how many kids

complained of stomach aches and awful stuff after eating crap food." The baked potatoes became so popular that Elena observed teachers using them as bargaining chips. "They would be like, 'Oh my god, you got an 'A' on this test! Get yourself a baked potato." She felt a swell of pride and gratification from the positive feedback.

Under Elena's guidance, the FFA program thrived. She was voted outstanding advisor of the year in 2013 and 2014. Her advisees (students involved in FFA) won first place in over half of the career development events and even qualified to go to Nationals. The blue corduroy jacket which was once the bane of every FFA kid's existence became a source of pride at Crooked Spruce. Elena remembers that, "By the end of the year when we actually started winning State awards and stuff, the kids were really proud to wear their jackets. They actually started FFA Fridays where they would all wear official dress on Fridays to show off their…"

As the FFA program increased in popularity, so too did the depth of their program. Elena was meeting with FFA kids 2-3 times a week during lunch as well as meeting after school. She was able to get a salad bar in the school cafeteria through the program Letsmove! While the students and staff loved it, the school district did not. She says:

> That has been a point of contention ever since with the district cuz', you know, you have to talk about how you are going to track and measure what the kids are eating…They are unhappy because they are like, the kids could be loading the entire plate with carrots. And I'm like, 'who cares?' They are eating carrots. That's better than the fries that you are feeding them.

What Elena saw as a natural progression-getting the district to source vegetables for the salad bar from Crooked Spruce's own garden-was a surprisingly difficult process. In order to sell produce

back to the school, the garden had to be up to GAPS (good agricultural practices). This included replacing a fence for the garden, building a covered wash stand, getting a Certified Food Protection Manager card, and ensuring that her FFA kids got food service cards. At this point, she applied for and got a Farm to School grant which helped buy aprons and hats that brought her students into school kitchen compliance. It also provided legitimization for their program and leverage to the school district to support their program. "Once we had all the paperwork in place and then we got grant funding from Farm to School, I knew the District would have to let us go through with it." During this time, the district was also flush with money from the Alaska Commerce Grant, which allocated $26,000 to each district to purchase local food. It was perfect timing for the district to be able to purchase vegetables grown in one of their very own school gardens.

The FFA program was thriving and the summer garden program was meeting a need that had never before been met. Elena felt strongly about helping, "tie them [students] to their food and tie them to nature and give them skills and make them feel empowered." The summer program was doing just that. Students were in charge of feeding their chickens and five Angora rabbits. Elena taught them the necessary skills and then let them figure out the details. She fondly recounts one of her favorite memories:

> So, I remember one day we had just learned the scientific names for all the vegetable families and I was like, 'Okay, guys, we are going to use our names and we are going to make a salad. In order to have something in the salad you need to tell me the scientific name of the vegetable family. So, here I had all these kids run into the garden to grab a vegetable and bring it back and they're like, 'We have some *aleaciea* and some

compociea and some *brasicacea*.' They were so excited about making this stupid salad.

And like, nobody is that excited about salad. I don't even get that excited about salad.

Elena noticed a huge shift in kid's eating preferences. At the beginning of the summer, kids preferred going to McDonalds during their lunch break. By the end of the summer, kids were beyond excited to make a salad together. Elena recounts that, "We're like a little family unit and here we are making lunch together. I don't know, it was just a great and natural progression from bad food to good food." Elena's involvement was definitely, "a labor of love." She was working 60-80 hours a week and was growing tired of the low level of compensation. She decided to ask the school to create a part-time teaching position that would allow her to integrate hands-on agricultural experience with classroom learning.

Riding a wave of success and positive feedback, Elena entered a board meeting lead by the current lead teacher, Brandon Nevado, who assumes duties similar to a school principal. The board meeting ended up denying her request to create a part time teaching position. Elena felt like the school administration, at this crucial moment, did not step up and support her. She was frustrated and heartbroken and said, "Sorry, I just can't do this anymore." With reluctance, she left her position which was, "the most heart-wrenching thing I have ever done…"

Since Elena left, Zoe has struggled to maintain the FFA program. When Elena left, Zoe assumed the role of interim FFA advisor. She recalls that finishing up the year in someone else's position was difficult. The following year, Zoe took over the position of FFA advisor. Despite her efforts to hold the program together, it has declined. She does not have the same number of participants and does not currently run the summer garden program. She has found that without

hands-on participation, student's interest in the salad bar has waned. As for Elena she looks back on her experience at Crooked Spruce with a complex mixture of joy and sadness.

4.1.3 Semi-structured interview with Stefan of Gold Hill School District. On a cold day in October where sunlight still prevails over darkness and the sun, hanging low over the horizon, baths the rolling hills in a golden sunlight, I drove out to talk with Stefan. We met in Stefan's office which occupied a corner of the pantry adjacent to the kitchen. Stefan is the food service coordinator for the Golden Hills School District. Before we settled down to talk, he popped his head into the kitchen and gave instructions to the two women working in the kitchen. He explained that one woman was a part time worker who held another part time position at the school, while the other woman was temporarily working there while she completed a 1,000 hour internship.

After briefly chatting with them, we settled down to talk at his desk. He sat behind his desk while I sat across from him, peering over a low wall of folders and binders. Stefan is a large man, 426 pounds, as he stated himself with a chuckle, who has established a uniform of a red-short sleeved T-shirt and a black bandana decorated with a pattern of small white peace signs. He loves food and launched into the story of the history of their school garden.

Stefan has worked for the school district for 12 years, which tend to blur together for him. It is difficult for him to produce precise dates. He thinks the garden got started about five years ago. It was originally a community garden. He, in collaboration with two women associated with the Native Council, applied for and received a Farm to School grant in 2011 and 2012. Stefan appreciates the garden, but has very little involvement in its day-to-day functions. He was able to lend insight about the garden from the perspective of a food service professional.

The Nutritional Alaska Food in Schools Grant is what Stefan was most excited to tell me about. "It was great," he says. "Not only were we buying fresh romaine and whatever we had in that garden, we bought grass fed beef, king crab, halibut, king salmon, shrimp, and scallops." The grant was a pilot program in 2012 and extended to 2015. Each year, he was allocated $26,000 dollars to buy food from registered food growers. This meant that he could buy food from the community garden and from locals who had registered. He liked being able to identify what he needed, place an order, and have it delivered.

The garden located adjacent to the school was great, and he was able to use lettuce that "lasts two weeks, which is longer than store-bought produce." However, he identified three main problems from his perspective with the school garden. First, the garden was most abundant when school was out of session. Second, he could not always get what he needed from the garden. Third, the produce required more time for him to process than store-bought produce.

Stefan is really only able to incorporate food from the garden for the first few months of school. He says, "Yeah, it was a great project for us to get involved in, but timing and different things didn't end up benefiting the kitchen and the school as much as I would have hoped." Another factor was that some of the vegetables that Stefan most wanted weren't available from the garden. He would like fewer potatoes because, "You know, USDA. I mean potatoes are a starch and I just can't. I'm only allowed so much starch a week." He would also like more broccoli and spicy peppers. He says, "I don't know if you noticed, but if you look on my counter from breakfast that Sriracha sits on my counter. Kids love that stuff. Jalapeños? Oh my god, I can feed them jalapeños, even the little ones." Finally, he says, the preparation is a big deterrent. He recounts getting a delivery of potatoes:

> And we do use potatoes but, there again, they came in with potatoes, and it took us, they took half the dirt with them. Thank goodness I had help here yesterday. That's what the young girl did; she washed potatoes. And so when I'm by myself, I don't have time to sit and wash 100 potatoes.

Stefan did communicate what he would like this past year with Cadence and Monica, the two women who run the garden. Still, he would prefer to buy produce from the Farmers Market, where Cadence sells produce from the garden. "Yeah, that's much easier. It's cleaned. It's ready to go. That's pretty much how we got our food." He does not have enough time to deal with produce that is not ready to use. He feels that the kitchen is understaffed and recalls that, "Most of the time I'm here by myself and we just didn't have enough time to process it. That was my biggest problem. They liked growing it. They liked doing all that stuff, but they wanted us to take just take it fresh out of the ground and process it, and that was kind of hard for us."

Ultimately, Stefan found the Nutritional Alaska Food in Schools Grant most effective at getting fresh, local, high-quality food into the diets of the children he cooked for. Some of the high school students that had grown accustomed to the high-quality food he served developed a greater awareness about their diet. They would ask, "Stefan, is this good meat?" He notices that the little kids were less keen to try new foods, but "the high school kids, the first time I fed them fresh shrimp they were like…we don't normally give seconds, but with stuff like that we just handed it out."

When I asked Stefan if the garden met his expectations, he responded, "In some ways, yes." He had wanted an indoor hydroponic project, but it never got off the ground. He felt this would be more useful since they could grow food year-round, especially during times when

school is in session. This project takes time, energy, money, and effort. He feels that the school lacks employee motivation to take this on and says, "It wouldn't be on my back."

4.1.4 Semi-structured interview with Cadence of the Native Council and the Gold Hill garden. Cadence does all of the maintenance for the Golden Hill garden, though she has the support of long-time gardener, Monica, who is also with the Native Council. She receives a small stipend from The Native Council for her time, energy, and effort; however, her involvement with the garden is a labor of love. It is a big job for one person. This past summer, she was able to hire two high-school aged boys to help her with the garden upkeep. This took some of the pressure off of her and it also worked towards fulfilling a desire of having more youth involvement in the garden.

While working with the two high school students this last summer, she noticed that the students were motivated by mechanical tasks. "If there was something mechanical, like the watering system, or the Native Council bought a couple little greenhouses at Fred Meyers. Anything mechanical, they liked." There was a regulation permitting them from using anything motorized, which Cadence appreciated. "Myself, being in charge, I don't know if I would have wanted them using it. You know, farm equipment is dangerous." The motorized equipment embodied an element of danger and required training for use, but on the other hand:

> They kind of got bored with the weeding thing. I had to think of ways to make it more fun. Maybe if there had been more kids. It was challenging at times….They liked planting and harvesting of course; pulling up carrots to take to our Saturday market. But the weeding, they were very bored with that."

She says that apart from hiring two youth last summer, they never had a real youth garden program. This is not for lack of trying, though. In the past, she and Monica have contacted the Resident Assistants (RAs) at the Residence Center adjacent to Gold Hill School which houses students who live in villages too remote for daily commuting. They have asked, "Can you give us a couple kids to help us?" She says, "We didn't get much interested there because it seemed like they had other programs." Along with already having a lot of other activities, Cadence has noticed that, "gardening isn't something first off that most kids would be excited about until they got in there and start digging in the dirt." Cadence was contacted by another school garden practitioner who was surprised that they did not have more student interest and suggested working together on a soil amendment project. She was excited about the prospect of collaboration with somebody else who had school garden experience.

In addition to wanting to include more youth in the garden, Cadence wishes that there was more buy-in from the food service professionals both at Gold Hill high school and the Residence Center. She has, however, noted more enthusiasm this past year than in previous years. "I wish they felt a little differently about it like, 'Oh, fresh Alaskan grown!'" She acknowledges that using garden produce requires extra effort. "They are used to putting in an order and getting their stuff. It does require a little more work," she says. She does her best to make the produce usable to the kitchen staff and says, "It's nice and clean. It's all in totes like they would get it at a farmer's market." Cadence thinks that in order to create more of a partnership between the garden staff and the food service professionals, they need to have more communication.

She and Monica have talked about organizing more clear channels of communication but, "by the time May comes around there is just a hustle-bustle" She would like to open up more dialogue and thinks that having a meeting with the food service professionals is the first step.

4.1.5 Semi-structured interview with Amy of Clear Water. I cannot help but admire the displays featured in the hallways of Clear Water Montessori School as I walk from classroom to classroom. Children's art decorates the walls combined with artifacts representing themes that have been studied. Each classroom is adorned with an individual picture of every student followed by the student's goals for the year as well as their teacher's goals for them. I am able to read about Amy's 7th and 8th graders before I enter her classroom. She is meeting with me directly after her class ends, and some students stay behind to catch up on work. In particular, one boy sits at a desk finishing an assignment and occasionally contributes to the conversation.

Taproot Community Farm and Learning Center maintains the garden in collaboration with Clear Water Montessori School. Amy went over what Taproot does for Clear Water saying, "They do summer maintenance, and, um, they help us figure out what needs to get done out there and then we have organized parent volunteer groups that come out throughout the summer. And, like I said, they provide the lessons." Last year, one of their staff members came and taught a lesson to Amy's class. "Last year we had some wonderful instructors from Taproot come out and we were learning about the human body for science so we did a lot of nutrition lessons and garden games. It's really nice to have some fresh energy and the kids respond well to that." This year, however, "we didn't get the…I just don't think they were available for that kind of outreach."

When I asked Amy how frequently her class uses the garden, she responded, "Um, not as frequently as I would like. I've only had two opportunities to be out there since the beginning of the school year." She and I walk to the window and look out at the garden as she tells me about one experience where her class really took ownership to improve the garden:

> This year we replaced our stage and we had this homemade stage, and we dragged them out to the garden and turned them upside down. We moved three of them before the school year ended, and they worked together using little scooter boards that are for fun PE activities. They realized that if one of the students that didn't weigh very much sat in there it would kind of weigh it down. They could push it through doorways and then could heave-ho it and then have a group standing on the other side of the fence. The mentors [the two middle school classrooms] filled them with dirt and we used those for raised beds. The kids really got behind it.

This was a high point, but momentum wanes when school ends. "When we come back in fall, unless families have been involved in some of those work groups, they don't really feel like they've had ownership of it." She adds that, "We have great parents. They just don't know what the garden rules are."

Parents are quite involved, and Amy communicates with them through a biweekly newsletter. She mentions, however, that she has never communicated with other school garden practitioners outside of Clear Water. When I asked her if that was something that would be helpful, she responded, "Yeah, I think it could be helpful." She mentioned that it may be hard to get other teachers on board if it means committing to more time.

Besides the misalignment of the growing season with the school year, there are a few other challenges to integrating the garden into her day-to-day curriculum: "We have a lot we need to cover. I mean, you are so very busy right at the end of the school year with graduation and we put on a big graduation for 8th graders and there are passage meetings which is the step before that. Yeah, so it's hard to make time for it right then as much as we would like to." In addition, the garden has faced some infrastructural challenges. She recounts that, "you know, one year we had a vole problem, and that was the same year where it rained all summer long," As a result of poor soil quality they, "haven't really gotten to experiment with different varieties of vegetables." Once they are able to increase soil, "I think we will have more teacher participation, but I feel like we have pretty good Clear Water community participation. As long as the parents know what it is we need help with, if they know, they will help."

4.1.6 Semi-structured interview with Nicole of Clear Water. Amy suggested that I speak with Nicole. After finishing up my conversation with Amy, I wandered the hallways until I found her classroom. Nicole was busy talking with another teacher, so I wandered took the opportunity to further investigate the well-decorated hallway walls. Seeing my opportunity, I walked in and introduced myself. She was very forthcoming and happy to share her experiences.

She begins by telling me about her class's involvement with the garden. One activity did not work out the way they had intended:

> They [Taproot] helped with creating a compost pile two years in a row although it never worked because we put it where our parking lot is, and every winter it got snow-ploughed. So, our kids, especially the 4th/5th/6th graders, worked so hard on putting on all

those layers, and they were so eager to see if it worked, and then it got ploughed away. So, that was hard.

Like Amy, she feels that another garden challenge is the lack of diversity in what is grown. When I asked her what she would like to see growing, she responded, "I don't know what it would be. I wish I did. They [Taproot] are really the experts. I feel like they know what they are doing." In exchange for managing the garden, Taproot asks for a $2,000 per year donation. Taproot, however, is flexible. "They say if you can't do it, we'll take whatever you can give." She also agrees with Amy that the ability to participate in a peer-to-peer garden practitioner network would be helpful, but making time for it would be a challenge.

Although there have been a few challenges, Nicole is very satisfied with the garden and shares some of her favorite memories. "So, one year every class harvested one crop and then with that crop we researched different recipes for that and then we made a big batch of it and invited parents…we all had a potluck together." She also tells me about a literacy lesson that she integrated into the garden. "We've gone out there before and they found an object in the garden and they would draw a picture of that object and then write about it, like, from the point of view of that [object]." They've also done a lot of math lessons out in the garden. "They've taken a square foot and counted how many rocks there were and estimated how many square feet the whole garden was and then tried to figure out how many rocks were in the garden."

Integrating her lessons into the school garden has been relatively easy for Nicole. "Yeah," she says, "I mean, it's not a burden for us to get out, and the kids like to get out there. You know, getting dirty, they love that!" Plus, "Our kids know that as part of Montessori, they have to do community service. They know that going out in the dirt and getting dirty is all part of

us working together to get this garden." Sometimes parents have resistance and say, "'kids shouldn't be working out there', but for the most part it is pretty good!"

4.1.7 Semi-structured interview with Leona of Taproot Community Farm and Learning Center. Leona was one of the two caretakers of the five gardens that Taproot oversees. The position is seasonal, and she intends to return to Taproot this summer to continue working with the five school gardens. We met at a coffee shop in town, where we sat by the window while she shared her experiences about last summer.

Leona and her good friend Alondra were in charge of taking care of the garden and had a high level of autonomy. The Taproot staff, she notes, was always supportive and helpful without ever being overbearing. If anything, she would have liked to have established more connections between the school garden team, who works offsite, and the rest of the Taproot staff, who work onsite.

Leona and Alondra were able to use their best judgment combined with past garden plans to create a plan for each garden. They did not meet with each school individually to develop an individual plan; this would have taken too much time. While the teachers at Clear Water speak of a desire for more plant diversity, Leona speaks of the difficulty in providing this.

Clear Water was a challenging school garden to maintain. The nature of the perimeter garden means that people are spread out while working. It is difficult to communicate with one another or feel unified in completing a task. In addition, the garden advocate at Clear Water that Taproot had previously interacted with had left the school. In this void, it took a while for another strong point of contact to develop. Leona feels like the expectations that the staff had of she and Alondra were challenging to uphold. The need for more clear and direct channels of

communication between Leona and the staff at Clear Water made caring for the garden more challenging. Leona says she would like to strive for clear and direct communication in the future, because at the end of the day, any school that is enthusiastic about wanting to grow a garden is a school that she wants to be involved with.

4.1.8 Semi-structured interview with Mariana of Quail Run. Although Mariana and I had never met, I recognized her instantly. She had on floral patterned Bogs. We sat down and began talking initially about how the school garden is funded. As part of the Catholic school system, she and school principal, Eloise O'Connor, applied for and received a one-time-only $5,000 grant. One of the requirements of the grant is that they "would provide fresh produce to the [nearby] soup kitchen." The act of growing a garden and sharing its abundance follows the Jesuit tradition and is something the school fully endorses.

Sharing food with the soup kitchen extends the boundaries of the garden from the school to the greater community. Although she does get some parent involvement through the mandatory service hours that parents must complete, she gets more community volunteers. Developing partnerships with parents and community members where they feel comfortable and competent in the garden takes time. So, too, does helping teachers feel adept at using the garden as an outdoor classroom.

While many teachers do participate in the garden, Mariana wishes that more would take advantage of this resource. When I asked her about strategies to increase teacher involvement in the garden, she replied, "I just think I would have to set the project in front of them and be real specific. This is the hand-out, this is the pre-teaching, and this is what you do out in the garden."

However, she does not have the time to do this for every single teacher. Still, she has developed a less time- intensive way to invite teachers into the garden.

She notices that some teachers are, "kind of unsure of what to do and afraid of doing the wrong thing and don't want to get dirty." Teachers seem insecure about not being in control in a foreign environment. In order to dissipate some of this uncertainty, she offers to take teachers out to the garden and show them around. She says, "Okay, I'll meet you in the garden at 2:45 and we'll take 15 minutes and I'll show you what to do." This time, away from students, is crucial to teachers feeling comfortable using the garden. "They can be a student. That way they can be in charge when they take their students out there." She says that it can be very intimidating to be out in the garden with students and not know what is growing.

She is motivated to help other teachers use the garden, due, in part, by her positive experiences using the garden as an outdoor classroom. She says that, "some kids that really struggle in the classroom, you can give them a pretty complicated job that involves lots of steps and they will just really succeed in the natural world when it involves gross motor skills or problem solving." She also notes that her students are able to engage in imaginative play like, "going to fish camp." "It was just so precious," she recounts.

In addition to providing a space where children can use creativity to play and problem solve, the garden is also a great place for children to try new foods. Although children often have resistance to trying new vegetables, Mariana has had success:

> Ohh, when I take kids to the garden, they so often say, 'I don't eat broccoli.' I will say, 'Well, try this broccoli. It's different.' Then, they'll eat, like, the whole plant. And kale! They love kale. They love to be able to find their own food and pick it right there. So

they are eating beans and peas and whatever is left in the garden in August when they start school. And they love it. They will eat kale until it is covered in snow!

Mariana is fueled to continue her work by past positive experiences. This carries her through the 50-hour work week. The school is able to offer her a small stipend of, "750 dollars a year which is probably about 2 dollars an hour." Ultimately, she continues the work because she loves working with children in the garden.

Mariana's passion for empowering teachers and youth alike to learn in the garden is evident. She has innovative solutions for poor soil quality as years of experience incorporating the classroom into the garden and the garden into the classroom. In response to whether or not she has the opportunity to network with other people doing similar work to her, she says, "That would be great. I would love to figure that out." Time, however, is a limiting factor. Most of the conferences are during the school day. Still, she sees the value in sharing ideas with others who are doing similar work. I had mentioned to her that another site had problems with poor soil quality and she replied that, "peer-to-peer learning would solve issues such as poor soil quality at Clear Water."

4.2 Themes from the Data

Each person has a story unique to themselves and their school, yet as I talk with school garden practitioners, certain themes consistently arise. In an effort to distill the most poignant ideas, I have identified themes that go beyond the obvious and expected. It is my hope that through exploring these themes, we can begin to understand the climate in which school garden practitioners in Fairbanks operate.

4.2.1 Not just small potatoes. Potatoes are a starch that every single garden has in common. They are what grow most easily and with the least amount of maintenance. Both Quail Run and Crooked Spruce used potatoes in their garden harvest celebrations. Amy mentions that baked potatoes were a part of a dinner potluck where parents were invited to celebrate the garden harvest. Quail Run also celebrates potatoes with a feast. "It's a big deal. It's a party," says Mariana.

Not only are they used in celebrating, but they are also used as a fundraiser. Elena recounts that, "every Friday we did baked potato sales where we would sell baked potatoes for, like, 5 dollars a potato and then you got chili and sour cream and cheese and stuff. So that was a huge constant supply of income for us." Additionally, Nicole had her students sell potatoes. "This fall, I had students weigh potatoes into five pound bags, so there was some math there, and then they made a little potato stand and then they sold the potatoes to families." Stefan, on the other hand, has less positive memories of potatoes. He remembers one year when they had so many potatoes they just didn't know what to do with them all. "In fact, one year, they planted so many potatoes. We had a huge warehouse behind us over there. The one lady, Monica, she had all these totes. I mean, we filled up the totes so you could barely lift them…we stacked 500 pounds of potatoes in there." The potatoes, from Stefan's perspective, are difficult to incorporate into the kitchen menu because they contain a lot of starch.

No matter the location, potatoes always come up in conversation more than once. They are an easy crop to grow that provides satisfaction and reward to children as they unearth them. The flavor of potatoes is mild enough that most children will not object to trying them.

4.2.2 Kids love dirt! Speaking of potatoes, kids love to dig in the dirt and search for these starchy gems. In fact, Mariana, Elena, and Cadence all noted that getting dirty was a big draw and source of enjoyment for kids working in the garden. Adults, however, are less enthusiastic about getting dirty as children.

Nicole views harvesting potatoes as one of the garden highlights because of students' enjoyment. "Last year, when we had the risen beds, and, oh my gosh, they love to harvest potatoes. You know, getting dirty, they love that. Getting dirty is actually one of the highlights for students. Nicole says that, "they know that going out in the dirt and getting dirty is all part of working together in the garden.

Cadence also thinks that getting dirty is a major draw for kids. In her experience, it is not always easy to entice children to work in the garden. Weeding becomes monotonous and planting seeds is repetitive. She knows that the secret to drawing kids to the garden is dirt because, "gardening isn't something first off that most kids would be excited about until they got in there and started digging in the dirt."

Mariana firmly believes in the benefits of allowing kids to get dirty, but she notices that parents and teachers are more reluctant to get dirty. When I ask her about teacher involvement, she responds that not every teacher is involved. "You know, a lot of them don't like to get dirty." "They are just kind of unsure what to do and afraid of doing the wrong thing and they don't want to get dirty." When parents have reluctance, she tells them that "it is a really important part of their brain development to work with natural product in a natural environment and get dirty."

For Stefan, dirt makes cooking with vegetables directly sourced from the nearby school garden more difficult. He is overwhelmed by the time necessary to clean them and prefers to buy

garden vegetables from the Farmers Market where he perceives them to be clean. Many practitioners have observed that the opportunity to dig in the soil and get messy is a draw for children. However, it is less attractive and, at times, a deterrent for adults.

4.2.3 Where did all the time go? Time, along with potatoes, is a theme that was mentioned by all interviewees. Unfortunately, this type of time does not have aromatic leaves that can be plucked from its woody stalk and sprinkled liberally throughout one's days.

Both Elena and Mariana mention working well beyond a 40-hour work week on a weekly basis. Elena remembers that she was working, "easily 60-80 hours a week," while Mariana mentions that she works 50 hours a week. Elena, Mariana, Stefan, and Amy are overextended. The perception of too much to do and not enough time to do it inhibits them from utilizing the garden, and in Stefan's case, the produce, as they would ideally like.

Including parents in the school garden is important to Mariana, and she would like to figure out a way to increase parents volunteering in the garden. It takes time, though. "You have to have something real specific, too. That's my experience with working with gardens and volunteers. You have to put a lot of effort in to making sure they feel appreciated and recognized." Working as much as she does, Mariana has not found the time to create a task-list and orientation book to help make parent volunteers feel more comfortable in the garden.

Like Mariana, Stefan found that faced with too much to do during the day, he was not able to utilize all the garden produce that came his way. He explains that a few years back, the district eliminated a full-time kitchen assistant position. Now, the district only provides a part-time assistant. He feels squeezed for time throughout the day and recounts that he simply could not make use of all the produce that was available. "Yeah, they'd bring me a bucket with 40

pounds of fresh vegetables, and I don't have time to sit and scrub and clean them," he remembers.

Elena found that in order to complete her job and facilitate the growth and expansion of an FFA club on campus, she had to work 60-80 hours a week. Ultimately, this schedule was not sustainable. She recalls that, "with no funding, I couldn't keep doing what I was doing. Yeah, I mean, I was falling behind on my student loans and I was working all the time…" The expectation that faculty run the school garden in addition to their full-time job overlooks the amount of time, effort, and energy that it takes to sustain a thriving school garden program that integrates students into its planning, preparation, and ongoing maintenance.

Not only do staff feel like they don't have enough time in the day, but Amy, Zoe, and Cadence also think that students' busy schedules are a barrier to participation. Amy, a 7th and 8th grade teacher at Clear Water Montessori School, says that the curriculum she must cover does not permit the students to have much free time to explore the garden. She also says that the times of year when weather allows garden participation are the busiest times of year for her students. "I mean, you are so very busy right at the end of the school year with graduation. We put on a big graduation for 8th graders, and then there are passage meetings which are the step before that. Yeah, so it's hard to make time for it right then as much as we would like to."

Zoe, too, wishes that the students had more free time to participate in FFA. She is only able to interact with them one day a week during lunch time. Since she has such a short time with advisories (student participant in FFA) in the first place, it is crucial that students are able to attend all meetings. However, towards the end of the year, students have more and more obligations that compete with their FFA commitment. One of these obligations is the need to

maintain their grades which can impinge on her lunch-time meetings. She also has a hard time communicating with her student's parents who are overworked as well.

Like Zoe, Cadence has noticed that students have a lot of other activities that compete for their time. She would like to see more youth participation in the garden that is adjacent to the Resident Hall. She has even asked RAs to send some kids over after school hours, but they have other programs that absorb their free time.

A perceived lack of time is a major barrier to utilizing the garden space and garden produce to their fullest potential. Interestingly enough, it is not just staff that is overextended. Students also have a myriad of different programs to join and obligations they must complete. Sometimes the school day is too packed with curricular needs to spend time in the garden or on agricultural projects.

4.2.4 Student empowerment. The students that are able to participate in school gardens uniformly experience a sense of empowerment and ownership. Elena says that one of her goals was to give students the skills to grow vegetables, learn how to preserve and cook them as a way of, "making them feel empowered. I think that's a really powerful part of farming is being able to provide for themselves." She noticed several different markers of student empowerment and personal growth throughout the three years that she worked at Crooked Spruce Charter School. She tells me the story of one of her students "who is, like, my favorite sweetest kid." After participating in FFA, he "started doing a lot more with his family." "He started cooking and helping out more. They actually had a community garden [plot] and he started helping with the community garden plot more because he had all these skills that he could then give to that."

She also noticed that students learned from their own experiences of trial and error and then were empowered to teach other students. After watching a peer fight with the hose and mangle plants in the process of watering another student would say. " 'Oh hey, I saw you watering the other day. Did you know you can do it this way and it saves time?' And they'd be like, 'Oh my god, that's so…' That just teaches them how to be in the world."

Elena is not the only person noticing how her students became empowered through working in the garden. Mariana also observed her students taking ownership of the garden and teaching other students about what they have learned. At Quail Run, there are a lot of inter-school projects. The younger kids are often paired with older kids for reading and mentorship. It is not uncommon, she says, for younger kids to be in the garden with older kids. Her pre-school students learn a lot about the garden and, "a lot of times, the pre-schoolers know a lot more about the garden than the older children. And that's just so good for them."

Zoe has also witnessed the positive effects of garden participation on her FFA students. She says that students enjoy having a task and being able to complete that task. "They enjoy, you know, when you give them a job, you know, and they have some ownership to that. That's what drives students." Overall, the garden has been a powerful learning space to inspire students to take pride in their contributions to a meaningful project.

4.2.5 Uncertainty. Humans naturally dislike uncertainty. Charles Berger and Richard Calabrese, the two theorists who pioneered Uncertainty Reduction Theory, argue that the purpose of human interaction is to reduce uncertainty which then increases comfort (Gibbs, Ellison, & Lai, 2010). One explanation for why staff and parent involvement in the gardens is

not as high as desired is due to a feeling of discomfort regarding uncertainty about how to behave in the garden.

Mariana noticed that some teachers were reluctant to use the garden as an extension of their classroom because they themselves have very little experience in the garden. She says that teachers ask themselves, "Why don't I know what this is? This is growing here. Why don't I know what it is?" "It's very intimidating," she says. She has found that teachers benefit from a mini-lesson in the garden before they use it with their students. She says this allows teachers to, "Be a student. That way they can be in charge when they take their students out there." Teaching at the edge of one's knowledge is uncomfortable. Teachers will avoid doing this unless they have a chance to reduce their uncertainty through personal experiences, training, or peer-to-peer learning.

Lack of agency and high levels of uncertainty are interrelated. The roots of disempowerment are varied; however, one reason is shifting decision-making to another group. Nicole expressed dissatisfaction with the lack of diversity present in the Clear Water garden. When I asked her what she would like to see growing, she replied, "You know, I don't even know. I guess…probably different flowers. It would be nice to have different flowers. Um, it's hard….I don't know what it would be. I wish I did. They [Taproot] are really the experts. I feel like they know what they are doing." While Nicole successfully integrates the garden into her curriculum, she has a hard time verbalizing how to increase crop diversity. Choosing what to plant in the garden is not her domain. Instead, Taproot oversees planting the garden.

Teachers are not the only ones that feel uncomfortable in the garden. Even parents who are willing to participate are uncomfortable with helping out in the garden. Amy is appreciative

of the willingness of Clear Water parents to participate in the garden. She says, "We have great parents. They just don't know what the garden rules are. I guess that would probably help….as long as parents know what it is we need help with, if they know, they will help." In addition, Taproot is responsible for the majority of the summer garden upkeep. As a result, Amy says if, "families have [not] been involved in some of those work groups, they don't really feel like they have ownership of it." They question whether they are allowed to taste things and wonder what is hands-off and what is not.

Amy's phrase, "if they know, they will help," poignantly demonstrates how uncertainty can be a deterrent towards participation. If parents are unsure of the rules, they are less likely to choose to be involved. Mariana has realized that with a little bit of extra help, teachers will feel empowered to conduct lessons in the garden.

4.2.6 Increasing communication channels. Dialing a lifeline for support is not something that school garden practitioners can readily do in Fairbanks. While there are several people involved in school gardening, there are few communication channels between them. Evidence that there is a need to develop clearer communication channels between practitioners is exemplified by commonalities in challenges practitioners experienced. Two schools experienced damage from voles, while one school's garden has poor soil fertility. Amy, from Clear Water, says that the voles' destruction was demoralizing. "They make quick work of it!" Elena and Zoe both remember transplanting delicate cabbage starts only to find them gnawed down to stubs the next morning. When I mentioned this to Cadence, she had the solution. She recalls that faced with voles and shrews, "people would bury a 3-pound coffee can in the ground…it's a no poison kind of remedy."

Like Cadence, Mariana also has a solution for poor soil fertility. Golden Valley produces a product similar to Milorganite, a fertilizer made with effluent from the waste treatment plant. According to Mariana, they have perfected the recipe for turning waste into wonderful compost which creates noticeably healthier plants. "Oh my gosh, it's amazing!" "It's just as safe as steer manure, and you don't get weeds!" she says. Golden Valley donates their compost to all those who pick it up at their office. They will also load up the back of a pick-up truck for $15. Creating opportunities for agricultural educators to network and connect with one another will lead to informal knowledge sharing and the spread of innovations.

There are three primary challenges to facilitating peer-to-peer learning, though. The first two challenges are organizational in nature and the third is structural. The first challenge is creating enough exposure at each site so that agricultural educators are able to recognize and locate one another. The second is in facilitating opportunities, whether face-to-face or digital, to connect. The third challenge challenge is in fitting networking and information sharing opportunities into busy schedules.

When I asked teachers if they would be interested in connection with other school garden practitioners, the response was overwhelmingly affirmative. However, there was a caveat: The process of connecting should not take up too much more time. School garden practitioners are interested in networking with other practitioners, but it has to be convenient and cannot compete with their other responsibilities.

4.3 Survey Data

The survey data is representative of seventeen different schools across the state of Alaska. There is vast climatic, cultural, and school structure differences represented in this data

set. I will use basic descriptive statistics to offer an overview of the data followed by a qualitative thematic analysis of the open-ended questions.

4.3.1 Descriptive statistics. Table 4.2 represents respondents' attitudes in terms of their feelings of support, ease of funding, ease of finding curriculum, and community/teacher involvement. The majority of respondents found that administration is supportive, that teachers are engaged and that the program has increased in scope. The respondents are split on whether continued funding was difficult to secure. Three respondents agree that it was difficult, four neither agree nor disagree, and three found that it was not difficult to secure. Likewise, respondents are split on whether curriculum was easy to find; two agree that it was easy, three neither agree nor disagree, and two strongly feel that it was difficult to find. While there is an overwhelming consensus that more community members were involved a year or more after the grant, respondents overall reported that fewer teachers are involved than in the beginning. However, when the question is asked with negative phrasing, the results are not consistent.

Table 4.2
Attitudes Regarding Support

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Administration was supportive	5	3		2	1
Teachers were engaged	2	3	1	1	1
Continued funding was difficult to secure	1	2	4	2	1
Curriculum was easy to find		2	3	2	
Farm to School program has increased in scope	3	5	1		2
More community members involved than beginning	3	5	2		1
Administration was supportive	2	2	2	2	3
Teachers were engaged	2	4		2	
Continued funding was difficult to secure	1		4	2	2

Table 4.3 examines the impact that respondents think the school garden has had on student's nutritional choices and awareness. The term *nutritional choices* refer to the decisions children make regarding the food they actually eat. The term *nutritional awareness* refers to children's knowledge of fruits and vegetables including their ability to name and identify them as well as a basic awareness of the relative health properties of the foods they eat.

The majority of respondents think that their Farm to School program has a high to very high impact on student's nutritional awareness, while the majority thinks that the program has only had a moderate influence on student's nutritional choices.

Table 4.3
Farm to School Program Impact on Nutrition

	Low	Moderate	High	Very High
F-2-S program impact on nutritional choices	2	6	2	
F-2-S program impact on nutritional awareness	1	4	3	2

Table 4.4 looks at the rate at which school gardens appear in media. School gardens are most frequently mentioned in newsletters, followed by School District websites. Social Media and Blogs are tied for the third most frequent way of publicizing the Farm to School program, while radio and newspaper come in fourth. The highest concentration of media exposure comes in the 'sometimes' category. Radio and TV are infrequently used. Some respondents of Farm to School programs indicate that if their program was featured on TV, then they were unaware of it. A possible explanation for this uncertainty is that staff may not have been employed at the school for the duration of the program's existence and do not know what occurred before their employment. Another possibility is that internal channels of communication within the school about media attention projects receive are not very strong.

Table 4.4
Media

	Frequently	Sometimes	Never	Don't Know
Social Media	2	4		1
Newspaper	1	6	1	1
Blog	2	1	2	2
School District Website	3	4	1	1
Radio	1	1	3	3
TV			3	4
Newsletter	6	1		1

Table 4.5 examines how much produce was grown last season. Some gardens are vastly more productive than others. The lowest producer was 10 pounds of produce and the highest producer was 2,000 pounds. The highest producer has access to a year-round greenhouse while the lowest producer does not. Across all gardens, the participating schools produced 3,321 pounds of produce. This is an average of 415.2 pounds per school.

Table 4.5
Pounds Harvested

Students Directly Involved (Per School)	Total (Pounds)
60	3321
10	Average
1000	415.2
50	Median
58	65
73	Range
70	Low =60
2000	High=2,000

Table 4.6 demonstrates that a total of 959 students were included in Farm to School projects. The average number of students included was 96. The lowest number of students was 12, the highest was 342.

Table 4.6
Number of Students Directly Involved

Students Directly Involved	Total:
(Per School)	959
50	Average:
12	95.9
40	
100	Median:
250	53
342	
24	Range:
60	Low = 12
56	High = 342

Table 4.7 tells examines what would help practitioners revive defunct programs or what additional resource would help existing programs run more smoothly. In general, the majority of respondents saw all four categories as beneficial, though the most overwhelming support is in favor of having access to more resources such as space, plants, seeds, or tools. This category received eight votes of support. A person to brainstorm and help plan has the highest number of votes for extreme support with six votes.

Table 4.7
Reviving the Program

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Stipend for a coordinator	4	2	4		
Community Champion	4	3	2		1
Resources such as space, plants, seeds, or tools	5	3	1		
Person to brainstorm	6	1	2	1	

The descriptive statistics allow us to gather an understanding of the level of productivity of Farm to School projects from respondents. It also offers a window into the attitudes of practitioners regarding school and community support, availability of curriculum, involvement of other teachers, and the degree to which Farm to School projects are featured in media, and ways to restore gardens to optimal performance.

4.3.2 Overview of an open-ended question. I asked the question, "If your Farm to School program is no longer running, would you like to see it run again in the future? Why or why not?" Some respondents that reported having a functioning garden also responded to this question. Respondents seem to be responding to the question, "What could make your program even better?" Of the program that is not currently running, the respondent stated that the program had been run by a PTA (parent teacher association), and when they stepped down nobody else offered to take on the responsibilities. In their case, a community champion or a paid position would alleviate gaps in programming when volunteers step down. Another site still has a program though it has greatly diminished since the previous coordinator stepped down. They

respond that an organized program that can intertwine academic instruction with activities in the garden is what is needed to revive the program.

One respondent of a program that currently exists but is looking to expand report reported that more funding will help them either continue or expand their program. "We have the interest, drive, volunteers, and support. We just need the supplies and equipment to do even more!" they wrote. Another respondent said that more help in the greenhouses would help their program thrive. They write, "It would be cool to start a program to train trainers." Another respondent shared that the garden was "an excellent experience for students and helped them realize the health and community benefits for eating locally grown foods." In addition, it provided "an excellent example of community strengthening and bringing adults to meet the youth in our community."

4.3.3 Comparison of survey and interview data. There are convergent as well as divergent themes in the two data sets. The similarities are due, in part, to an overlap of survey and interview respondents. It is also indicative of shared experiences regardless of location in Alaska. There are four primary similarities I will discuss before examining the divergences.

The first similarity is that both survey respondents and interviewees think that the agricultural education program is beneficial to their students. Everyone expressed positive impacts and a desire to see the program continue and expand. The second similarity is in regards to teacher involvement. The survey data indicates that fewer teachers were involved than in the beginning of the program. The desire to see more staff involved corresponds with interview data. The third similarity is that the majority of educators in both data sets perceive administrators to

be supportive. The fourth and final similarity is the observation that nutritional awareness increases at a higher rate than changes in nutritional choices.

The data sets diverge on two primary themes. The first oppositional finding relates to media representation. With the exception of Crooked Spruce, the schools in Fairbanks report low media exposure. Overall, survey schools had higher rates of media exposure than those in Fairbanks. It is worth noting that all schools involved in the survey received the state Farm-to-School grant whereas Crooked Spruce and Golden Hill were the only two that received the Farm-to-School grant in the Fairbanks area. Recipients of the Farm-to-School grant were compelled to create media exposure in order to comply with the Farm-to-School grant. The second divergence relates to the ability to find continued funding. While the survey data (see Table 4.2) shows an even split between those who found it difficult to secure continued funding and those that did not, all four schools in the Fairbanks area were able to secure continued funding. However, Zoe does mention that money is a barrier in terms of expanding the project to include a full-time agricultural education teacher. The next chapter focuses on the implications of this data, identifies areas for further research, discusses topics of additional interest, and acknowledges limitations.

Chapter 5: Discussion

5.1 Contributions to the Field of Communication

This research is unique in the field of communication in that it focuses on the communication channels that help or hinder the spread of agricultural education. The examination of agricultural education, conducted within the discipline of communication, is testament that the field of communication is ripe this type of research. My research, using DIT as a lens for looking at agricultural education, is also evidence that DIT is a useful tool for examining agricultural education. DIT is useful because it emphasizes examining communication channels which are very important in connecting agricultural education practitioners. Strengthening communication channels will create more support for educators and increase knowledge about each program.

This research examines how communication within a social structure affects rates of diffusion, which is uncommon. Rogers (1983) remarks, "there have been relatively few studies of how the social or communication structure of a system affects the diffusion and adoption of innovations in that system" (p. 25). Through the process of interviewing participants in the Fairbanks social system, I discovered that current communication structures leave room for increasing peer-to-peer dialogue as well as institutional information sharing. Increasing the flow of information sharing between peers will likely increase the rates of diffusion (Rogers, 1983).

5.2 Research Limitations

The first limitation is a bias towards receiving survey information from contacts where the original Farm to School project is still functioning. It was more difficult to establish a point of contact for the survey at sites where the program had been discontinued. As a result, the

majority of the survey recipients are associated with projects that are still functioning. Consequentially, the sample is not representative of both programs that have been discontinued and those that still exist

The second limitation is a small survey sample size, which is not uncommon in Alaska. There are four principal reasons for a small sample size. First, there were a small number of total possible recipients. Second, I was not able to secure contact information for all possible recipients. Third, I was unable to offer incentives for participation. Finally, I only sent out one reminder to recipients I who had not yet filled out the survey. More frequent reminders to complete the survey may have increased survey response rate.

5.3 Areas of Future Research

In order to gather a more complete understanding of all of the agricultural educators in the Fairbanks area, more interviews need to be conducted. The purpose of this is to gather a baseline level of knowledge about what exists and a further understanding of limitations and successful strategies at each site. The more that is known about what agricultural educators are doing, the more policy makers can learn about how best to support them. However, interviewing schools that have some type of agricultural education component is only half of the story. Future research should also focus on conducting in-depth interviews of non-adapters to the innovation. Rogers (1983) points out that the majority of diffusion research has focused on surveying adopters of an innovation while little research has gone into studying those that choose not to adopt. Studying non-innovators allows one to understand the perspective of those who have chosen not to pursue a school garden or other agricultural education programs at their site.

In addition to gathering more interview data, expanding the scope of surveys to include Farm to School programs that have been discontinued is necessary. Gathering information from sites that were not able to sustain programming would provide valuable insight regarding why these programs ended. This, in turn, would provide insight into how best to support pre-existing programs.

5.4 Challenges to Diffusion

Rogers (1983) explains that as long as the rate of awareness-knowledge remains under 20-30% of the population, there is little adoption. The 20-30% marker can be perceived as the tipping point. After this point is reached, then each percentage of awareness-knowledge is associated with several more percentile increases in adoption. The process of diffusing an innovation takes considerable and consistent work up until it reaches a tipping point. In Alaska, 70% of school districts report the presence of a school garden. The concept of school gardens has deep inroads in this state, despite the geography of the state.

5.4.1 Presence of heterophily. Rogers (1983) defines heterophily as the degrees of differences between groups that interact with one another. Attributes of heterophily include religion, cultural heritage, physical environment, social status, level of education, and shared experiences.

Alaska encompasses a diverse range of climatic conditions and cultures of peoples. It is the largest state in the United States and covers 663,300 square miles. When Alaska is superimposed over a map of the Lower 48, it occupies most of the Midwest and its non-contiguous land masses span the distance between Florida and California (How Big is Alaska?

n.d.). There is a high degree of variability or heterophily between each community in terms of climate, culture, and lifestyle.

A similar format for a school garden in Barrow, Alaska which is located above the Arctic Circle will not be effective in Sitka, Alaska which is 885 flight miles northwest of Seattle, Washington. When there are high degrees of homophily, it is more likely that, "communication will have greater effects in terms of knowledge gain, attitude formation and change, and overall behavior change" (Rogers, 1983, p. 19). Conversely, high degrees of heterophily, which are present in Alaska, decrease the effectiveness of communication. Alaska is a big and diverse state. This is neither strength nor weakness; it is merely a fact that one must consider and navigate when creating programming aiming to include the entire state.

5.5 Policy Reccomendations

5.5.1 Pro-innovation bias. DIT has received criticism for being pro-innovation, even if the innovation does not contribute to the greater good of a population. With respect to this criticism, it is necessary to proceed with awareness when continuing to advocate for agricultural education programs so as not to push for something that can be divisive.

The goal of agricultural education programs is to benefit all children and all members of the community, not just the children of wealthy parents and the segments of community living in affluent areas. When proceeding with support for agricultural education programs, it will be important to ensure that schools in lower socio-economic neighborhoods with a base of children from low-income families have the opportunity to participate in thriving agricultural education programs.

5.5.2 The downfalls of relying on volunteers. Agricultural education programs thrive when there is a strong garden advocate or "champion." This advocate is often a volunteer or is minimally compensated for their time. While organizing volunteers is a resourceful response to minimal or non-existent funding, it is not sustainable. Kloppenburg and Hassanein (2006) advise that volunteers are, "not intended to be, nor can [they] be, a permanent displacement of paid labor." (p. 419). In order to grow viable agricultural education programs, positions need to be created for agricultural educators that offer competitive compensation. It is time to work towards building agricultural education programs intertwined with academic instruction facilitated by educators who are compensated for their time.

The transition of agricultural education from after school, during lunch, and in-your-spare-time will have to be a cultural transition as much as an organizational transition. Farmers and farming is a culturally undervalued profession, as evidenced by the shrinking rate of farmers in this country and the compensation that farmers receive. In the US, farm and ranch families comprise 2% of the population (Fast Facts About Agriculture, n.d.). In Alaska, there were a total of 762 farms as of 2012 and the average net income was $11, 271 (United States Department of Agriculture, 2014). Nationwide, 50-60% of farmers claim second jobs in order to remain financially solvent (Marshall-Genzer, 2015). We all must eat, yet it is challenging to encourage youth to become farmers when the average income is low. When small and mid-size farmers are able to earn a living wage from farming, the profession will have more social legitimacy. At this point, there will be more incentive to shift agricultural education from extra-curricular and volunteer-coordinated to funded programs intertwining academic instruction and hands-on experience based learning.

5.5.3 School hierarchy. Teachers generally hold a minimum of a Bachelors degree in education while administrators generally hold a Masters Degree or PhD. School food service professionals hold a minimum of a GED, meaning they may or may not have finished high school. This results in a high degree of heterophily, or differences between food service professionals and teachers/administrators (Rogers, 1983).

Each school can be seen as a social system or, "a set of interrelated units that are engaged in problem solving to accomplish a common goal" (Rogers, 1983, p. 24). When there is a high degree of heterophily within a social system, as there are in schools, it can inhibit cooperation. This high degree of heterophily may be one contributing factor to the gap between farm to school and farm to table.

5.5.4 The need to work together. While individual schools can be seen as a social system, so too can they be seen as individual units that comprise the greater Fairbanks social system. From this perspective, it is crucial that each unit effectively communicates and cooperates with one another. There is a place in this city and state for every single organization that supports agricultural education.

5.6 Policy Recommendations

The driving motivation for researching this topic is to be able to contribute to the body of knowledge about agricultural education in Alaska. The intention is that this knowledge may be helpful in shaping future policy. As such, the following section will address policy recommendations based upon the research I have conducted and relevant literature.

5.6.1 Snacks. It is often difficult to facilitate Farm-to-Table opportunities due to small sizes of school gardens, procurement, financial and organizational barriers (Kloppenburg,

Wubben, & Grunes, 2008). Crooked Spruce, Quail Run, and Clear Water all celebrate the garden with food-sampling celebrations. With the exception of the Gold Hill garden, which provides food for the Gold Hill School District, the other schools have not been able to integrate vegetables from the garden into their school cafeteria system. Quail Run and Clear Water require their students to bring a lunch from home, and Crooked Spruce was never officially integrated into the school meals.

Elena, at Crooked Spruce, tried to create recipes incorporating garden vegetables, but the process of getting these recipes approved, prepared, and served was very time-consuming. The cookbook "Make it Local" features USDA approved recipes that incorporates local Alaskan foods. The cookbook was made possible by effort from the Child Nutrition Programs of the Department of Education & Early Development. They hired the UAF Cooperative Extension and consulted with the Farm to School Program to create the cookbook using money from a USDA grant. This book is a significant resource for food service professionals who have the time, staff, desire, budget, and structural capacity to prepare these meals. Ultimately, the realization of consistently serving local food as part of school lunches is out of the direct control of individual agricultural educators. The existing gap between the garden and the school lunch table is in part responsible for children demonstrating higher levels of a nutritional awareness than changes in nutritional choices.

One way to bring that control back to educators who use the garden is to feature the vegetables grown in the garden as snacks. Kloppenburg et al., (2008) suggest the, "creation of a fresh fruit and vegetable classroom snack program [is] a simpler, more practical approach than transforming meals" (p. 10). Serving vegetables as snacks maneuvers around two primary

barriers: The first being that school gardens rarely produce enough produce to supplement meals consistently for the whole school and, second, bringing the food directly into the classroom bypasses barriers the kitchen may have with processing vegetables. Serving snacks in the classroom has the additional benefit of providing an opportunity for participatory education where preparing snacks can be interwoven into class curriculum.

Given the feasibility of serving snacks in the classroom, I recommend that the Cooperative Extension tailor snack recipes to align with foods readily produced in school gardens throughout Alaska. Increasing frequency of exposure to fruits and vegetables will positively affect children's attitudes. Kloppenburg et al. (2008) write that ten or more exposures to a new food are often necessary to influence eating preferences. While this may not be achievable while relying on the food item in question to appear in school lunches, it is possible if teachers are able to involve their students in preparing snacks.

5.6.2 Teacher Training. The time has come to train the trainers. The theme of disempowerment came up when the care and maintenance of school gardens are outsourced to another group. Teacher trainings can increase participation in the garden helping the school community take ownership of their garden and be the chief decision-makers regarding what is planted, who takes care of it, and how it is structured as an outdoor classroom. Assuming ownership of the garden may present a steep learning curve, and teacher training is a tool for empowering educators to take on the challenge. Training would reduce uncertainty regarding how to care for the garden and how to incorporate it into curriculum. Training would also legitimize the garden as a valuable extension to the classroom. While training is crucial, it must be accessible to educators.

Efforts to offer training to teachers are already underway. Alaska Agriculture in the Classroom, a program coordinated by Fairbanks Soil and Water Conservation District is collaborating with UAF amongst others to offer a teacher training course. NRM F595/ED F595 is specifically designed to introduce K-12 educators to the "many aspects of Alaska agriculture, including conservation, production, and marketing" (Course Description, para.1, 2016). NRM F595/ED F595 is an intensive 36-hour program spread out over the course of four, nine hour days. The class fulfills either 1 or 2 continuing education credits, depending on whether participants choose to complete an optional extra 1 credit component of the class.

School administrators should encourage their staff to enroll in this class. Ideally, teachers interested in completing this course would be either partially or fully reimbursed for their costs upon completion; however, this may not be feasible. If offering a financial incentive is not possible, then administrators should reward this behavior through positive reinforcement.

Interviewees consistently cited a lack of extra time as a deterrent towards taking on more responsibilities. In order to overcome this obstacle, diversified methods of delivering training should be explored within schools that offer some type of agricultural education programming.

One possibility is to incorporate training into mandatory teacher in-service meetings. Training should be bi-annual with one training taking place at the beginning of the year and one at the end of the year. It must be participatory, inspirational, and professionally presented. Securing funding to develop training that targets each school's unique project is big barrier. It is impractical to think that tailored training can be offered for each site. Instead, an organization with experience developing agricultural educational training materials could create a video that addresses broad topics such as: The planting schedule for various geographic zones in Alaska,

basic information on cold-weather composting, and tools for outdoor classroom management. This video would be the first installment of the training designed to promote conversation around incorporating the garden into curriculum. The second segment of training would be a staff led hands-on training in the garden followed by a discussion on how to implement current educational goals.

5.6.3 Increasing word-of-mouth publicity. The best way to persuade others to adopt an idea is through word-of-mouth dissemination (Parra-Lopez et al., 2007; Rogers, 1983). One way to generate more peer-to-peer connections is to create a virtual knowledge hub, where all information regarding agricultural education in the Fairbanks area is compiled. This data hub would include at minimum grant opportunities, curriculum resources, and project descriptions with a point of contact for agricultural education programs in the Fairbanks area. The site could evolve to include connections for businesses willing to donate goods, individuals or organizations willing to donate time, knowledge, or services, and retailers that support Farm to School projects by offering a discount. The knowledge hub would be created and hosted by an organization, but information could be crowd sourced. Crowd sourcing is the best technique for keeping data that changes frequently up-to-date with the least amount of labor. For example, individual schools could take responsibility for ensuring that their project description and point of contact is updated. Open-sourcing does not eliminate the need for a person to oversee the hub, but it does decrease the amount of labor required.

The hub would be an easily searchable, visual platform that increases the observability, or the level of visibility to others (Rogers, 1983). The hub will bridge the gap between agricultural education practitioners and increase knowledge sharing. Rogers (1983) explains that,

"the essence of the diffusion process is the information exchange by which one individual communicates a new idea to one or several others" (p. 17). Creating a network with which educators can easily communicate is one means of fostering innovation sharing. It is also a successful tool for persuasion because other schools' successes reduce the level of uncertainty about whether or not investing in a garden will be a good choice. Diffusion of agricultural education programs is likely to increase at a faster rate if individuals are able to share their experiences and network with other practitioners.

The question remains: Who will be responsible for creating and maintaining the hub? There are several organizations in Fairbanks that are committed to supporting agricultural education. Maybe one of these organizations could take the lead; however, with many organizations receiving state funding facing reduced funding, this is a difficult mandate. The Alaska Food Policy Council is currently discussing the idea of creating and supporting a knowledge hub, though they have not been able to secure a funding source for this project.

5.6.4 Affirmation. The fifth step in the process of diffusion of innovation is the confirmation stage. This is the stage in which adopters examine the success of the innovation and decide to continue or discontinue the innovation. Rogers (1983) says that, "At the confirmation stage, the individual (or other decision-making unit) seeks reinforcement for the innovation decision already made, but may reverse this decision if exposed to conflicting messages about the innovation" (p. 184). Within Alaska, for various reasons, there are many cases in which adopters discontinue their agricultural education program. The reasons for this are complex and layered requiring an equally complex solution; however, there is one basic step that can be taken to increase the likelihood of schools affirming the success of their innovation.

The creation of a plaque honoring schools that have met specified criteria for their agricultural education programs would help schools confirm the success of their program. The plaque can be displayed in an area of prominence at the front of the school and afford each program legitimacy and a sense of permanence. The more publicity and positive praise for programs, the greater chance that programs will choose to continue their agricultural education program. Lilly (2009) points out that in addition to the knowledge of the benefits of an innovation, people need additional motivation. A prestigious award bestowed upon schools that meet certain criteria also serves as incentive for other schools to innovate and create their own program.

Inspiration for a plaque awarded to schools meeting a specific set of criteria can be found through Project Learning Tree's Green Schools program (https://www.plt.org/greenschools). The Green Schools program can provide guidance; however, it is not a perfect fit for Alaska do to the requirement that all schools use the same curriculum and attend specific trainings.

5.7 Conclusion

Meter and Goldberg (2014) recommend that in order to create a future of food security, the state of Alaska must take responsibility for ensuring that its youth are food literate. The future of Alaska must be one that embraces agricultural education programs as a core part of curriculum. This research contributes to the conversation by exploring existing programs that are working to meet this goal.

State agencies such as the Division of Agriculture have the ability to attract federal funds that support agricultural investment in many capacities and generate positive media exposure. There is a real opportunity for the state to make a modest investment at the agency level that

would enable the Division of Agriculture to continue generating opportunities for projects that contribute towards education, production, infrastructure, innovative farming techniques, and food safety. An investment in the state agencies such as the Division of Agriculture marketing department provides sound returns. In the 2016 fiscal year, the Division of Agriculture marketing department oversees $1,000,000 in leveraged federal dollars while only costing the state of Alaska around $50,000 during that same time period (J. Herron, personal communication, June 18th, 2016).

Alaska is a young state with a history steeped in resource development and extraction. One must understand the past development of agriculture in Alaska in order to understand the present. The first chapter established a framework for which to explore a few of the social structures that support agricultural education in Fairbanks as well as other parts of the state. The second chapter reviews relevant literature regarding DIT theory as well as current research using DIT to help understand organic agriculture, Fair Trade, and climate conscious practices. The third chapter reviews choices in method. The fourth chapter explores emerging themes from both interview and survey data, and the fifth chapter explores policy recommendations.

Findings from the data suggest that despite difficulties, those who have been involved in agricultural education projects desire to see them continue and administrators are generally supportive. Of the programs that are still operating, the majority have increased in scope over time. The greatest barriers are time, the need for a consistent community champion, access to more tools, seeds, and starts as well as funding to provide for a paid school garden coordinator.

Alaska has inherent structural challenges that make diffusion more difficult, but these challenges are not prohibitive. Research exploring the successes as well as struggles will provide

stakeholders with more information with which to continue existing conversations about how best to support agricultural education.

An agricultural education movement is well underway in Alaska; The 2015 USDA Farm to School census reports that 76% of school districts and 252 schools participate in Farm to School activities (Alaska Districts, n.d.) The continued diffusion of agricultural education is of utmost importance given that the state needs to build food security (Meter and Goldenberg, 2014) and faces rising rates of obesity and associated diseases (Alaska Obesity Facts Report, 2014). It is time to sustain and build upon efforts towards creating agricultural education programs guided by local knowledge from each community. Kloppenburg (1991) says:

> There is indeed a growing interest in bringing the farmer back in. But we need to be clear about what it is we are bringing together before we can decide how that is to be accomplished. There now exists a window of opportunity in which to reverse the historical marginalization of local knowledge and to move the development of agricultural science out of its established trajectory and onto a reconstructive path. (p. 536).

Throughout the country, schools are bringing the farmer back. Educators are training youth to expand their concept of who a farmer is and to realize that too can be a farmer. Although Alaska faces unique challenges such as severe weather, a boom and bust economy that is currently in recession, and a small population spread across a landmass that spans from the Atlantic to the Pacific Ocean, the movement continues to grow.

While mass media is effective during the knowledge/information stage, peer-to-peer information exchange is most effective for persuasion and confirmation (Rogers, 1983). In order

to aid in growth, supporters of agricultural education need to talk about it with their friends, family members, neighbors, and school administrators. Local newspapers need to take initiative and write about school gardens in their communities. As farming is legitimized as a modern and respectable career, more and more youth will pursue a career in farming. The more youth that choose to pursue farming as a career, the more new innovations will develop. Together, this community can unite to support the next generation of farmers who will innovate, problem solve, and provide fruits and vegetables grown in Alaska for Alaskans.

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Appendix A

Survey Introduction

Farm to School Garden Survey

Introduction

You all have been identified as being involved with your school's Farm to School program. Your participation is voluntary. You are free to choose whether or not you want to participate in this study. If you do choose to participate, please fill out this survey with as much detail as you can. This survey is part of a bigger project that explores how best to support schools in their Farm to School agricultural endeavors. Your work is important, and I work to support school garden education. -Annie Silverman

Appendix B

Semi-structured Interview Questions

Semi-structured Interview Questions:

Hi, my name is Annie Silverman. I am a master's student in Professional Communication at the University of Alaska in Fairbanks. My background is in school gardening, elementary education, and farming. I am curious about individual school employees' experiences in regards to their school gardens. In specific, I am interested in finding out about what successes, struggles, and strategies garden caretakers have used in order to create and maintain their gardens. You have been selected for this interview because you have been involved in or have knowledge of this school garden project. I am also interested in gathering multiple perspectives about each garden project. Do you know anyone else who has knowledge of this garden and would be willing to share their experiences?

1. How many teachers participated?
2. How many students participated? In what ways did they participate?
3. Did the school hire a staff member to coordinate garden activities and develop curriculum?
4. If not, who is responsible for developing age appropriate activities and lessons that involved the garden. Did they receive training?
5. What kinds of responses do children who participate in the garden generally have?
6. Have you noticed a change in children's willingness to try new foods or their food preference as a result of their involvement in the garden?
7. Did the school cafeteria feature any of the food grown in the garden, or did it serve similar foods the children were growing but procured from another source?
8. Is the school able to purchase local food? If so, from whom, how much and what kind?
9. Did the school participate in any farm related field trips or host a guest speaker?
10. Are parents or other community members involved in harvest celebrations, school potlucks, or garden meals?
11. Who is responsible for maintaining the garden during summer months?
12. How large is the garden? What types of plants are grown?
13. Where do the resources to obtain seeds, tools, plant starts, storage containers, and other needed farm related material come from?
14. Did the garden activities meet your expectations? What component was the biggest success? Was there any aspect of creating or maintaining that did not work well?
15. If the garden programs have diminished since receiving the grant, what resources would you need to create a garden that meets the school's needs?

16. In the year preceding the garden grant, how many times was the school garden featured in local news?
17. If the school received media attention, did this affect the image of the school within the community? Did it help the school attract more volunteers or outside grants?
18. Tell me about a fond memory that you have of the garden.

Appendix C

IRB Approval Letter

(907) 474-7800
(907) 474-5444 fax
uaf-irb@alaska.edu
www.uaf.edu/irb

Institutional Review Board
909 N Koyukuk Dr. Suite 212, P.O. Box 757270, Fairbanks, Alaska 99775-7270

June 21, 2016

To: Karen Taylor, Ph.D
Principal Investigator

From: University of Alaska Fairbanks IRB

Re: [748064-1] Not Just Small Potatoes: Agricultural Education in Alaska

Thank you for submitting the New Project referenced below. The submission was handled by Exempt Review. The Office of Research Integrity has determined that the proposed research qualifies for exemption from the requirements of 45 CFR 46. This exemption does not waive the researchers' responsibility to adhere to basic ethical principles for the responsible conduct of research and discipline specific professional standards.

Title:	Not Just Small Potatoes: Agricultural Education in Alaska
Received:	April 26, 2015
Exemption Category:	2
Effective Date:	June 16, 2015

This action is included on the July 15, 2015 IRB Agenda.

Prior to making substantive changes to the scope of research, research tools, or personnel involved on the project, please contact the Office of Research Integrity to determine whether or not additional review is required. Additional review is not required for small editorial changes to improve the clarity or readability of the research tools or other documents.